

# Thunder n6550EX ///

S4989

Version 1.1

#### Copyright

Copyright © MiTAC International Corporation, 2008. All rights reserved. No part of this manual may be reproduced

or translated without prior written consent from MiTAC International Corporation.

#### Trademark

All registered and unregistered trademarks and company names contained in this manual are property of their respective owners including, but not limited to the following.

TYAN<sup>®</sup>, Thunder n6550EX are trademarks of MiTAC International Corporation.

 $\text{AMD}^{\textcircled{B}}$  ,Opteron  $^{\texttt{TM}},$  and combinations thereof are trademarks of AMD Corporation.

AMI<sup>®</sup>, AMIBIOS<sup>®</sup>, and combinations thereof are trademarks of AMI Technologies.

Microsoft<sup>®</sup>, Windows<sup>®</sup> are trademarks of Microsoft Corporation.

Nvidia<sup>®</sup> and nForce<sup>®</sup> are trademarks of Nvidia Corporation.

IBM<sup>®</sup>, PC<sup>®</sup>, AT<sup>®</sup>, PS/2<sup>®</sup> are trademarks of IBM Corporation.

Winbond<sup>®</sup> is a trademark of Winbond Electronics Corporation.

## Notice

Information contained in this document is furnished by MiTAC International Corporation and has been reviewed for accuracy and reliability prior to printing. MiTAC assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TYAN<sup>®</sup> products including liability or warranties relating to fitness for a particular purpose or merchantability. MiTAC retains the right to make changes to product descriptions and/or specifications at any time, without notice. In no event will MiTAC be held liable for any direct or indirect, incidental or consequential damage, loss of use, loss of data or other malady resulting from errors or inaccuracies of information contained in this document.

# Contents

Before	you begin	V
Chapte	er 1: Instruction	1
1.1	Congratulations	1
1.2	Hardware Specifications	1
1.3	Software Specifications	2
Chapte	er 2: Board Installation	3
21	Board Image	4
22	Block Diagram	5
2.2	Board Parts Jumpers and Connectors	6
2.0	Installing the Processor	16
2.4	Heat sink Installation	10
2.5	Thear Sillik Inisialiation	10
2.0	Finishing Installing the Least sink	10
2.7	Tinishing installing the field slitk	19
2.8	The set line at a Manager	20
2.9	Installing the Memory	23
2.10	Attaching Drive Cables	26
2.11	Installing Add-In Cards	27
2.12	Connecting External Devices	28
2.13	Installing the Power Supply	29
2.14	Finishing Up	30
Chante	ar 3: KVM-over-IP Server Management	31
Chapte	er 3: KVM-over-IP Server Management	<b>31</b>
<b>Chapte</b> 3.1	er 3: KVM-over-IP Server Management Overview of KVM-over-IP Sever Management	<b>31</b> 31
Chapte 3.1 3.2	er 3: KVM-over-IP Server Management Overview of KVM-over-IP Sever Management Key Feature	<b>31</b> 31 31
Chapte 3.1 3.2 3.3	er 3: KVM-over-IP Server Management Overview of KVM-over-IP Sever Management Key Feature Initialize and Web Interface	<b>31</b> 31 31 32
Chapte 3.1 3.2 3.3 3.4	er 3: KVM-over-IP Server Management Overview of KVM-over-IP Sever Management Key Feature Initialize and Web Interface Configuration	<b>31</b> 31 31 32 35
Chapte 3.1 3.2 3.3 3.4 3.5	er 3: KVM-over-IP Server Management Overview of KVM-over-IP Sever Management Key Feature Initialize and Web Interface Configuration Menu Option	<b>31</b> 31 32 35 42
Chapte 3.1 3.2 3.3 3.4 3.5 3.6	er 3: KVM-over-IP Server Management Overview of KVM-over-IP Sever Management Key Feature Initialize and Web Interface Configuration Menu Option Notes	<b>31</b> 31 32 35 42 78
Chapto 3.1 3.2 3.3 3.4 3.5 3.6 Chapto	er 3: KVM-over-IP Server Management Overview of KVM-over-IP Sever Management Key Feature Initialize and Web Interface Configuration Menu Option Notes	<b>31</b> 31 32 35 42 78 <b>83</b>
Chapte 3.1 3.2 3.3 3.4 3.5 3.6 Chapte 3.1	er 3: KVM-over-IP Server Management Overview of KVM-over-IP Sever Management Key Feature Initialize and Web Interface Configuration Menu Option Notes er 4: BIOS Setup About the BIOS	<b>31</b> 31 32 35 42 78 <b>83</b> 83
Chapte 3.1 3.2 3.3 3.4 3.5 3.6 Chapte 3.1 3.2	er 3: KVM-over-IP Server Management Overview of KVM-over-IP Sever Management Key Feature Initialize and Web Interface Configuration Menu Option Notes er 4: BIOS Setup About the BIOS	<b>31</b> 31 32 35 42 78 <b>83</b> 83 83
Chapte 3.1 3.2 3.3 3.4 3.5 3.6 Chapte 3.1 3.2 3.3	er 3: KVM-over-IP Server Management Overview of KVM-over-IP Sever Management Key Feature Initialize and Web Interface Configuration Menu Option Notes er 4: BIOS Setup About the BIOS BIOS Menu Bar Setup Basics	<b>31</b> 31 32 35 42 78 <b>83</b> 83 83 83
Chapte 3.1 3.2 3.3 3.4 3.5 3.6 Chapte 3.1 3.2 3.3 3.4	er 3: KVM-over-IP Server Management Overview of KVM-over-IP Sever Management Key Feature Initialize and Web Interface Configuration Menu Option Notes er 4: BIOS Setup About the BIOS BIOS Menu Bar Setup Basics Getting Help.	<b>31</b> 31 32 35 42 78 <b>83</b> 83 83 84 84
Chapte 3.1 3.2 3.3 3.4 3.5 3.6 Chapte 3.1 3.2 3.3 3.4 3.5	er 3: KVM-over-IP Server Management Overview of KVM-over-IP Sever Management Key Feature Initialize and Web Interface Configuration Menu Option Notes er 4: BIOS Setup About the BIOS BIOS Menu Bar Setup Basics Getting Help In Case of Problems	<b>31</b> 31 32 35 42 78 <b>83</b> 83 83 83 84 84 84
Chapte 3.1 3.2 3.3 3.4 3.5 3.6 Chapte 3.1 3.2 3.3 3.4 3.5 3.6	er 3: KVM-over-IP Server Management Overview of KVM-over-IP Sever Management Key Feature Initialize and Web Interface Configuration Menu Option Notes er 4: BIOS Setup About the BIOS BIOS Menu Bar Setup Basics Getting Help In Case of Problems BIOS Main Menu	<b>31</b> 31 32 35 42 78 <b>83</b> 83 83 83 84 84 84 84 85
Chapte 3.1 3.2 3.3 3.4 3.5 3.6 Chapte 3.1 3.2 3.3 3.4 3.5 3.6 3.7	er 3: KVM-over-IP Server Management Overview of KVM-over-IP Sever Management Key Feature Initialize and Web Interface Configuration Menu Option Notes er 4: BIOS Setup About the BIOS BIOS Menu Bar Setup Basics Getting Help In Case of Problems BIOS Main Menu BIOS Advanced Menu	<b>31</b> 31 32 35 42 78 <b>83</b> 83 83 83 84 84 84 84 85 86
Chapte 3.1 3.2 3.3 3.4 3.5 3.6 Chapte 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8	er 3: KVM-over-IP Server Management Overview of KVM-over-IP Sever Management Key Feature	<b>31</b> 31 32 35 42 78 <b>83</b> 83 83 83 84 84 84 84 84 85 86 106
Chapte 3.1 3.2 3.3 3.4 3.5 3.6 Chapte 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9	er 3: KVM-over-IP Server Management Overview of KVM-over-IP Sever Management Key Feature	<b>31</b> 31 32 35 42 78 <b>83</b> 83 83 83 83 84 84 84 84 85 86 106 108
Chapte 3.1 3.2 3.3 3.4 3.5 3.6 Chapte 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 3.10	er 3: KVM-over-IP Server Management Overview of KVM-over-IP Sever Management	<b>31</b> 31 32 35 42 78 <b>83</b> 83 83 83 84 84 84 84 84 86 106 108 113
Chapte 3.1 3.2 3.3 3.4 3.5 3.6 Chapte 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 3.10 3.11	er 3: KVM-over-IP Server Management Overview of KVM-over-IP Sever Management Key Feature	<b>31</b> 31 32 35 42 78 <b>83</b> 83 83 83 84 84 84 84 84 86 106 108 113 114

Chapt	er 5: Diagnostics	129
4.1	Beep Codes	129
4.2	Flash Utility	129
4.3	AMIBIOS Post Code	130
Appendix: How to Make a Driver Diskette		
Gloss	ary	135
Techn	ical Support	141

## Before you begin...

#### Check the box contents!

The retail motherboard package should contain the following:

	1x S4989 Motherboard						
	3 x SATA Power Cable						
D	6 x SATA Cable						
	4 x CPU Backplane						
2 x SAS to Backplane Cable							
	1 x S4989 User's Manual						
	1 x S4989 Quick Reference Guide						
1 x TYAN <sup>®</sup> Driver CD							
Builden	1 x I/O Shield						

If any of these items are missing, please contact your vendor/dealer for replacement before continuing with the installation process.

VII http://www.tyan.com

## 1.1 - Congratulations

You have purchased one of the most powerful server solutions. Based on Nvidia<sup>®</sup> NPF3600 and NPF3050 chipsets, the Thunder n6650EX (S4989) is designed to support AMD<sup>®</sup> Opteron<sup>™</sup> Rev. F 8000 series Dual-core and Quad-core processors and up to 128GB DDRII-400/533/667/800 memory, providing a rich feature set and incredible performance. Leveraging advanced technology from AMD<sup>®</sup>, the Thunder n6650EX (S4989) is capable of offering scalable 32 and 64-bit computing, high-bandwidth memory design, and lightning-fast PCI-E, PCI-X bus implementation.

The Thunder n6650EX (S4989) not only empowers your company in today's demanding IT environment but also offers a smooth path for future application usage. TYAN<sup>®</sup> is also proud to deliver the Thunder n6650EX (S4989) in SAS and SATA II flavor. All of this provides the Thunder n6650EX (S4989) the power and flexibility to meet the needs of nearly any server application.

Remember to visit TYAN<sup>®</sup>'s Website at <u>http://www.tyan.com</u>. There you can find information on all of TYAN<sup>®</sup>'s products with FAQs, online manuals and BIOS upgrades.

# 1.2 - Hardware Specifications

#### Processors

- Four 1207-pin ZIF socket
- Supports up to four AMD® Opteron<sup>™</sup> Rev. F 8000 series Dual Core/ Quad-core processors
- Up to 1.0GHz Hyper-Transport link support
- Four onboard 5-phase VRDs (four phases for CPU-core and one phase for North bridge)

#### Chipset

- nVidia<sup>®</sup> nForce<sup>®</sup> Pro 3600+ nVidia<sup>®</sup> nForce<sup>®</sup> Pro 3050
- PERICOM<sup>®</sup> PI7C9X130 PCI-E bridge
- PERICOM<sup>®</sup> PI2PCIE412-D SLI switch
- HW monitors:
  - (1) WinbondW83793G (2) ADT7476

#### **Expansion Slots**

- (2) PCI-E slots with x16 signal (1) x 16 signal from MCP55
  - (1) x 8 or x16 signal (through PCI-E switch) from IO55
- (2) PCI-E slots with x8 signal from IO55
- (2) PCI-X 133MHz slots from PERICOM PI7C9X130 (through IO55)

#### System Management

• KVM-over-IP server management on board (M3 type)

#### **Onboard SAS Controller**

- LSI 1068E SAS controller
- (8) SAS ports
- RAID 0,1,1E support

1 http://www.tyan.com

#### Memory

- Dual-channel memory bus
- 32 x 240-pin 1.8-volt DDRII DIMM sockets (eight on each CPU)
- Maximum of 128GB DDRII-400/533/667/800
- Supports ECC Registered DIMMs

## Integrated I/O

- (2) USB headers (two ports in one header)
- (6) SATAII connectors from MCP55 (one is for CD-ROM)
- (8) SAS ports (2 four-in-one connectors) from LSI 1068E
- (2) RJ-45 10/100/1000 LAN ports from 82571
   (1) RJ-45 10/100 LAN port from onboard KVM-OVER-IP server management
- (10) 4-pin FAN headers with autofan and tachmeter function
- (1) 2x9-pin front panel header
- (1) 2x7-pin TYFP2 header
- (1) 2x9-pin FAN header for Barebone
- (1) 2x3-pin LCM header

## **Back Panel I/O Connector**

- Stacked connector for PS/2<sup>®</sup> keyboard and mouse
- Stacked connector for (2) USB 2.0
- Stacked connector for VGA+COM
- $\bullet$ (3) RJ-45 connectors, side by side

## Integrated Network Processor

- GbE Intel 82571 (2x GbE ports)
- Davicom DM9161AE (PHY) for onboard KVM-over-IP server management (LAN3 MAC is integrated in KIRA100)
- WOL and PXE support
- (3) RJ-45 ports with LEDs

## Integrated 2D PCI Graphics

- XGI Z9S
- PCI interface
- 32MB DDRII frame buffer memory

#### BIOS

 AMIBIOS<sup>®</sup> on 8Mbit LPC Flash ROM

#### Form Factor

- SSI / Extend ATX(13"x 16.2")
- PCB layer:10-layer

#### Power

- EPS12V
- (1) 24-pin,3V+5V+12V power connector
- (2) 8-pin,12V power connector
- (1) 4-pin, 12V power connector

#### Regulatory

- FCC Class B (DoC)
- European Community CE (DoC)

# 1.3 - Software Specifications

For OS (operation system) support, please check with Tyan support for latest information.

You are now ready to install your motherboard.

#### How to install our products right... the first time

The first thing you should do is reading this user's manual. It contains important information that will make configuration and setup much easier. Here are some precautions you should take when installing your motherboard:

- (1) Ground yourself properly before removing your motherboard from the antistatic bag. Unplug the power from your computer power supply and then touch a safely grounded object to release static charge (i.e. power supply case). For the safest conditions, TYAN<sup>®</sup> recommends wearing a static safety wrist strap.
- (2) Hold the motherboard by its edges and do not touch the bottom of the board, or flex the board in any way.
- (3) Avoid touching the motherboard components, IC chips, connectors, memory modules, and leads.
- (4) Place the motherboard on a grounded antistatic surface or on the antistatic bag that the board was shipped in.
- (5) Inspect the board for damage.

The following pages include details on how to install your motherboard into your chassis, as well as installing the processor, memory, disk drives and cables.

# NOTE DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED.

## 2.1- Board Image



This picture is representative of the latest board revision available at the time of publishing. The board you receive may or may not look exactly like the above picture.

## 2.2 - Block Diagram



## Thunder n6650EX (S4989) Block Diagram

## 2.3 - Board Parts, Jumpers and Connectors



This diagram is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above diagram. But for the DIMM number please refer to the above placement for memory installation. For the latest board revision, please visit: <a href="http://www.tyan.com">http://www.tyan.com</a>

6 http://www.tyan.com

## Jumpers & Connectors

Jumper/Connector	Function
J1/J3/J4/J5/J6/J7/J32/J34/J36/J37	Fan connector
J8	PSMI Header
J9	Front Panel Header for Barebones System
J18	LCM Header
J19	Front Panel Header
J20/J21	USB 2.0 Header
J23	PCI-X Mode Selection
J29	BBU Fan Connector
JP3	Clear CMOS
JP8	XG21 VGA Enable/Disable Jumper
JP9	IPMB Pin Header
JP4	PCI-E configuration selection
JP22	PCI-X clock frequency 133/100 MHz selection

## Jumper Legend

OPEN - Jumper OFF	Without jumper cover
CLOSED - Jumper ON	With jumper cover

↑ Pin-1	To indicate the location of pin-1
↑ Pin-1	To indicate the location of pin-1

## Jumper Placement



#### JP3: Clear CMOS



8 http://www.tyan.com



J1/J3/J4/J5/J6/J7/J32/J34/J36/J37: 4-pin fan connector

	Pin	1	2	3	4
Pin 1	Signal	GND	+12V	TACH	PWM
NOTE: When using t functionality.	he 3-pin fa	ans, you	ı will hav	e no auto	o fan



**J8: PSMI Header** 

	Pin	1	2	3	4	5
	Signal	SMBUS CLOCK	SMBUS DATA	RSVD (NC)	GND	VDD_3P 3_DUAL
Pin_1						

### J9: Front panel Header for Barebones Systems

	Signal	Pin	Pin	Signal
	LAN1_LED+	1	2	LAN1_LED-
	LAN2_LED+	3	4	LAN2_LED-
	LAN3_LED+	5	6	LAN3_LED-
	ID_LED+	7	8	ID_LED-
	ID_S/W+	9	10	ID_S/W-
Pin_11 Pin_12	Key	11	12	RSVD

#### J18: LCM Pin Header

Pin_1		Signal		Pin	Pin	Signal	
		VCC_5_RUI	<	1	2	RXD	
		KEY PIN		3	4	GND	
		VCC_5_ALV	V	5	6	TXD	
<b>Use</b> this header to monitoring function.	C	onnect to the	е	LCM	modu	le with syste	m

## J19: Front Panel Header Connector

1 2	Signal	Pin	Pin	Signal
	HD LED+	1	2	PW_LED+
	HD_LED-	3	4	PW LED-
	GND	5	6	P_S/W
	RESET	7	8	GND
	GND	9	10	FANFAIL_H
	EXT_NMI	11	12	FANFAIL_L
	5VSB	13	14	Key
	SDA	15	16	GND
17 18	SCL	17	18	INTRUDER_L



J20/J21: USB Pin Header

	Signal	Pin	Pin	Signal			
PIN_2 PIN_10	+5VPWR	1	2	+5VPWR			
	USB0-	3	4	USB1-			
	USB0+	5	6	USB1+			
	GND	7	8	GND			
PIN_1 PIN_9	KEY PIN	9	10	GND			
Use this header to connec	t to the USB	device	es via t	the provided			
<b>Use</b> this header to connect to the USB devices via the provided USB cable.							

#### J23: PCI-X Mode Selection Header

	Pin	1	2	3	4
	Signal	N/C			10k TO
Pin_1	Signal	N/C	GND	FOI_FOIXCAF	GROUND

PCI Mode = Short 2-3 PCI-X 66Mhz = Short 3-4 PCI-X 100/133Mhz = 1-2 (Default)

#### J29: BBU Fan Connector

Signal	Pin	Pin	Signal
SYS1_TACH	1	2	SYS6_TACH
SYS2_TACH	3	4	SYS7_TACH
SYS3_TACH	5	6	SYS8_TACH
SYS4_TACH	7	8	SYS9_TACH
SYS5_TACH	9	10	SYS10_TACH
GND	11	12	KEY PIN
SYS2_PWM	13	14	CPUX_PWM
SYS11_TACH	15	16	SYS13_TACH
SYS12_TACH	17	18	SYS14_TACH

### JP8: XG21 VGA Enable/Disable Jumper

Pin_3 Normal (Default)	Pin_1 & Pin_2 closed: default setting
Pin_3	Pin_2 & Pin_3 closed: disable XG21

#### JP9: IPMB Pin Header

		1	n	
	Pin	1	2	3
Pin_1	Signal	IPMB DATA	GND	IPMB CLK



#### JP4: PCI-E Configuration Selection

	<b>D</b> :	_	•	
	Pin	1	2	3
Pin_1	Signal	PCIEX16 DETECT_L	IO55 PEMOD SEL_L	NC

## JP22: PCI-X Clock Frequency 133/100 MHz Selection

	Pin	1	2	3
Pin_1	Signal	1k to GND	S_SEL100	1k to 3.3V

# 2.4 - Installing the Processor

Your brand new Thunder n6650EX (S4989) supports the latest 64-bit processor technology from AMD<sup>®</sup>. Only AMD<sup>®</sup> Opteron<sup>™</sup> Rev. F 8000 series processors are certified and supported with this motherboard.

Check our website for latest processor support. http://www.tyan.com

# $\ensuremath{\text{TYAN}}^{\ensuremath{\text{\$}}}$ is not liable for damage as a result of operating an unsupported configuration.



The diagram is provided as a visual guide to help you install the socket processor and may not be an exact representation of the processor you have.

Step 1: Take off the CPU protection cap.

**Step 2**: Pull the CPU lever up to unlock the CPU socket (A). Then open the socket in the direction as shown (B).

**Step 3**: Place the CPU on the CPU socket, ensuring that pin 1 is located in the right direction.

**Step 4**: Close the CPU socket cover (A) and press the CPU socket lever down to secure the CPU (B).



Take care when installing the processor as it has very fragile connector pins below the processor and can bend and break if inserted improperly.

> 16 http://www.tyan.com

# 2.5 - Heat sink Installation

After installing the processor, you should proceed to install the heat sink. The CPU heat sink will ensure that the processor do not overheat and continue to operate at maximum performance for as long as you own them. The overheated processor is dangerous to the motherboard.

For the safest method of installation and information on choosing the appropriate heat sink, use heat sinks validated by AMD. Please refer to AMD's website at <a href="http://www.amd.com">http://www.amd.com</a>.

The following diagram illustrates how to install heat sink onto the CPU of S4989.



Place the heat sink on top of the CPU and secure it to the motherboard using two screws clockwise.

## 2.6 - Thermal Interface Material





There are two types of thermal interface materials designed for use with the AMD<sup>®</sup> Opteron<sup>™</sup> processors.

The most common material comes as a small pad attached to the heat sink at the time of purchase. There should be a protective cover over the material. Take care not to touch this material. Simply remove the protective cover and place the heat sink on the processor.

The second type of interface material is usually packaged separately. It is commonly referred to as 'thermal compound'. Simply apply a thin layer on to the CPU lid (applying too much will actually reduce the cooling).

NOTE

Always check with the manufacturer of the heat sink & processor to ensure the Thermal Interface material is compatible with the processor & meets the manufacturer's warranty requirements

# 2.7 - Finishing Installing the Heat sink

After you have finished installing the heat sink onto the processor and socket, attach the end wire of the fan (which should already be attached to the heat sink) to the motherboard. The following diagram illustrates how to connect fans onto the motherboard.



Once you have finished installing all the fans you can connect your drives (hard drives, CD-ROM drives, etc.) to your motherboard.

# 2.8 - Tips on Installing Motherboard in Chassis

Before installing your motherboard, make sure your chassis has the necessary motherboard support studs installed. These studs are usually metal and are gold in color. Usually, the chassis manufacturer will pre-install the support studs. If you are unsure of stud placement, simply lay the motherboard inside the chassis and align the screw holes of the motherboard to the studs inside the case. If there are any studs missing, you will know right away since the motherboard will not be able to be securely installed.



21 http://www.tyan.com

Some chassis' include plastic studs instead of metal. Although the plastic studs are usable,  $\mathsf{TYAN}^{\circledast}$  recommends using metal studs with screws that will fasten the motherboard more securely in place.

Below is a chart detailing what the most common motherboard studs look like and how they should be installed

.



#### Mounting the Motherboard

# 2.9 - Installing the Memory

Before installing memory, ensure that the memory you have is compatible with the motherboard and processor. Check the TYAN<sup>®</sup> Web site at: <u>http://www.tyan.com</u> for details of the type of memory recommended for your motherboard.

The following diagram shows common types of DDR2 memory modules.



- AMD Opteron™ processors support 64bit (non-interleaved) or 128bit (interleaved) memory configuration.
- ECC Registered DDRII-400/533/667/800 memory modules are supported.
- All installed memory will automatically be detected and no jumpers or settings need changing.
- The Thunder n6650EX (S4989) supports up to 128GB of memory.

#### NOTE:

- 1). Refer to the memory population option table for detailed memory configuration instruction.
- 2). For the DIMM number please refer to the motherboard placement in "2.3 -Board Parts, Jumpers and Connectors" for memory installation.

#### Memory Population Option Table

To correctly install the memory in pairs (DIMMA# + DIMMB#), refer to the table for supported population options. Start installing Memory modules from DIMM7 and DIMM8.

	Sir Ir (CF	ngle C Istalle PU0 or	PU ed าly)	i (C	ual CF nstalle CPU0 a CPU1	PU ed ind )	F	Four C install	PU ed
Quantity of memory installed	2	4	8	4	8	16	8	16	32
CPU0_DIMM1(A)			$\checkmark$			$\checkmark$			$\checkmark$
CPU0_DIMM2(B)			$\checkmark$			$\checkmark$			$\checkmark$
CPU0_DIMM3(A)			$\checkmark$			$\checkmark$			$\checkmark$
CPU0_DIMM4(B)			$\checkmark$			$\checkmark$			$\checkmark$
CPU0_DIMM5(A)		$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$
CPU0_DIMM6(B)		$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$
CPU0_DIMM7(A)	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
CPU0_DIMM8(B)	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
CPU1_DIMM9(A)						$\checkmark$			$\checkmark$
CPU1_DIMM10(B)						$\checkmark$			$\checkmark$
CPU1_DIMM11(A)						$\checkmark$			$\checkmark$
CPU1_DIMM12(B)						$\checkmark$			$\checkmark$
CPU1_DIMM13(A)					$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$
CPU1_DIMM14(B)					$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$
CPU1_DIMM15(A)				$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
CPU1_DIMM16(B)				$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
CPU2_DIMM17(A)									$\checkmark$
CPU2_DIMM18(B)									$\checkmark$
CPU2_DIMM19(A)									$\checkmark$
CPU2_DIMM20(B)									$\checkmark$
CPU2_DIMM21(A)								$\checkmark$	$\checkmark$
CPU2_DIMM22(B)								$\checkmark$	$\checkmark$
CPU2_DIMM23(A)							$\checkmark$	$\checkmark$	$\checkmark$
CPU2_DIMM24(B)							$\checkmark$	$\checkmark$	$\checkmark$
CPU3_DIMM25(A)									$\checkmark$
CPU3_DIMM26(B)									$\checkmark$
CPU3_DIMM27(A)									$\checkmark$
CPU3_DIMM28(B)									$\checkmark$
CPU3_DIMM29(A)								$\checkmark$	$\checkmark$
CPU3_DIMM30(B)								$\checkmark$	$\checkmark$
CPU3_DIMM31(A)							$\checkmark$	$\checkmark$	$\checkmark$
CPU3_DIMM32(B)							$\checkmark$	$\checkmark$	$\checkmark$
Noto									

1."  $\checkmark$  " indicates a populated DIMM slot.

We strong recommend that install memory in pairs.
 Please always install memory from the furthest A channel DIMM slot.

24 http://www.tyan.com

#### Memory Installation Procedure

Follow these instructions to install memory modules into the Thunder n6650EX.

1. Press the locking levers in the direction shown in the following illustration.



2. Align the memory module with the socket. The memory module is keyed to fit only one way in the socket.



3. Seat the module firmly into the socket by gently pressing down until it sits flush with the socket. The locking levers pop up into place.



# 2.10 - Attaching Drive Cables

#### **Attaching Serial ATA Cables**

The Thunder n6650EX (S4989) is equipped with **6** Serial ATA (SATA) channels. Connections for the drives are very simple. There is no need to set Master/Slave jumpers on SATA drives.

Please refer to FRU List for the related cables. If you are in need of SATA/SAS cables or power adapters please contact your place of purchase.

The following pictures illustrate how to connect an SATA drive



- 1. SATA drive cable connection
- 2. SATA drive power connection
- 3. SATA cable motherboard connector
- 4. SATA drive power adapter

# 2.11 - Installing Add-In Cards

Before installing add-in cards, it's helpful to know if they are fully compatible with your motherboard. For this reason, we've provided the diagrams below, showing the slots that may appear on your motherboard.



Simply find the appropriate slot for your add-in card and insert the card firmly. Do not force any add-in cards into any slots if they do not seat in place. It is better to try another slot or return the faulty card rather than damaging both the motherboard and the add-in card.

**TIP:** It's good practice to install add-in cards in a staggered manner rather than making them directly adjacent to each other. Doing so allows air to circulate within the chassis more easily, thus improving cooling for all installed devices.

NOTE

**YOU MUST ALWAYS** unplug the power connector to the motherboard before performing system hardware changes to avoid damaging the board or expansion device.

# 2.12 - Connecting External Devices

Your motherboard supports a number of different interfaces through connecting peripherals. See the following diagrams for the details.



**NOTE**: Peripheral devices can be plugged straight into any of these ports but software may be required to complete the installation.

#### **Onboard LAN LED Color Definition**

The three onboard Ethernet ports have green and yellow LEDs to indicate LAN status. The chart below illustrates the different LED states.

	10/100/1000 Mbps LAN Link/Activity LED Scheme			
		Left LED	Right LED	
10 Mbps Link		Green	Off	
10 Mbps Active	Blinking Green	Off		
100 Mbpo	Link	Green	Green	
	Active	Blinking Green	Green	
1000 Mbpo	Link	Green	Yellow	
	Active	Blinking Green	Yellow	
No	Link	Off	Off	

## IPMI LAN Port LED (LAN3) Color Definition

	10/100Mbp	s IPMI LAN Link/Activ	ity LED Scheme	
		Left LED	Right LED	
10/100Mbmo	Link	Green	Green	
	Active	Blinking Green	Green	
No L	ink	Off	Off	

# 2.13 - Installing the Power Supply

There are four power connectors on your Thunder n6650EX (S4989). The Thunder n6650EX (S4989) supports EPS 12V (24 pin+8 pin+4 pin) power supplies, please use below combination:



#### J2: 4-Pin EPS 12V PWR Connector

Signa	l Pin	Pin	Signal	
GND	1	3	+12V	
GND	2	4	+12V	

#### PWR2/3: 8-Pin EPS 12V PWR Connector

	Signal	Pin	Pin	Signal	
	GND	1	5	+12V	
	GND	2	6	+12V	
	GND	3	7	+12V	
لكالكا	GND	4	8	+12V	

<sup>29</sup> http://www.tyan.com

	Signal	Pin	Pin	Signal	
	+3.3V	1	13	+3.3V	
	+3.3V	2	14	-12V	
» »	GND	3	15	GND	
	+5V	4	16	PS_ON	
>>	GND	5	17	GND	
× ×	+5V	6	18	GND	
2	GND	7	19	GND	
	PWRGD	8	20	Reset	
× ×	5VSB	9	21	+5V	
* *	+12V	10	22	+5V	
> >	+12V	11	23	+5V	
N N	+3.3V	12	24	GND	

#### PWR1: 24-Pin EPS 12V PWR main Connector

We suggest using a 1000W or higher power supply; this of course depends on how many devices you attach. A 1000W is probably sufficient for systems however a higher wattage solution may be needed if the system is fully loaded. Look to the <u>http://www.tyan.com</u> website for further information.

NOTE

**YOU MUST** unplug the power supply before plugging the power cables to motherboard connectors.

# 2.14 – Finishing Up

Congratulations on making it this far! You're finished setting up the hardware aspect of your computer. Before closing up your chassis, make sure that all cables and wires are connected properly, especially IDE cables and most importantly, jumpers. You may have difficulty powering on your system if the motherboard jumpers are not set correctly.

In the rare circumstance that you have experienced difficulty, you can find help by asking your vendor for assistance. If they are not available for assistance, please find setup information and documentation online at our website or by **calling your vendor's support line**.
# 3.1- Overview of KVM-over-IP Sever Management

The KVM-over-IP Sever Management provides remote system monitoring and control even when the operating system is absent or fail, and empowers server boards with advanced industry standard features. It effectively enables IT Managers to have remote and multi-interface access to monitor, control, and diagnosing activities. KVM-over-IP Sever Management is powered by a Raritan Kira100 Baseboard Management Control(BMC).Kira100 is a fully-integrated "system-on-chip" microprocessor, which runs embedded Linux to complete a variety of tasks. There is flexibility to choose among Keyboard Controller Style (KCS), Intelligent Platform Management Bus (IPMB) and standard IPMI-over-LAN communication as defined in latest IPMI 2.0 specification. KVM-over-IP Sever Management hardware is OS-independent and fully compatible with all major IPMI compliant software. Users can access KVM-over-IP SM via any JAVA enabled web browser. There isn't any additional client software needed.

# 3.2 - Key Feature

- IPMI 2.0 compliant
- Hardware monitoring
- Remote Power Management
- Serial-over-IP
- KVM-over-IP
- Keyboard/Mouse emulation via USB
- Virtual Disk via USB
- Web browser support
- SSLv3 encryption and certificate
- CMOS Clear
- ID LED
- Warning LED and Buzzer

# 3.3 - Initialize and Web Interface

After you connect the power supply cable, KVM-over-IP Sever Management will take 40-50 seconds to initialize. The initial network interface is configured with DHCP by default. To retrieve the IP address of KVM-over-IP Sever Management, you could look the records in DHCP server or use IPMI utility. Of course, if DHCP doesn't meet your requirement, you can also use any IPMI software to configure its network interface. Detail procedure is described in following chapters.

KVM-over-IP Sever Management can be accessed by a standard JAVA enabled web browser. The default protocol is HTTP. Enter KVM-over-IP Sever Management IP address in URL and you will be connected to KVM-over-IP Sever Management login page.

Initial Login Setting:

User Name:	super
Password:	pass

🗿 Authentication - Microsoft Internet Explorer	
Eile Edit View Favorites Iools Help	<u></u>
🔇 Back 🝷 🕥 🗧 🛣 😰 🏠 🔎 Search 🤺 Favorites 🚱 🔗 - 🌺 🔟 👻 🎇 🎇	
Address 🕘 http://192.168.0.121/auth.asp	🔽 🔁 Go 🛛 Links 🎽
Authenticate with Username and Password! Username super Password even	
E Done	🥑 Internet 🛛 🔡

During first login, you will be required to change the password.

Change Password - Microsoft Internet Explorer	
Elle Edit View Favorites Tools Help	<b>A</b>
🌀 Back 🔻 🌍 - 💌 🖻 🏠 🔎 Search 👷 Favorites 🚱 🔗 - چ 🔟 🔹 🛄 🦓	
Address 🕘 http://192.168.0.121/pwchangeforced.asp	Go Links 💙
	0
Change Password	
Old Password	
New Password	
Confirm New Password ••••••	
Арру	
	×
a Done a Contraction of the Cont	Internet

If login successfully, you will be redirected to following page. Click "Console" on top left corner, you can open the remote console.

🗿 Home - Microsoft Internet E	xplorer	
<u>File Edit View Favorites To</u> r	lis <u>H</u> elp	
🌀 Back 👻 🐑 💌 😰	😚 🔎 Search 👷 Favorites 🚱 🔗 - 🌺 🗹 - 🗾 🏭 🥸	
Address 🕘 http://192.168.0.121/ht	me.asp 💌	🔁 Go Links »
Home Console		A Logout
	Dente Court Dente	
Remote Control	Click to open	
Virtual Media	Pain House Fund Log. Fund	
System Health	TRU Viewer and Fairtennesses Second State Readings Flack Fireware Phase Fireware Provide State Fire States (States States S	
Ovatent ricalar	PER SPECTOR County Design Unit here - 3	
User Management		
KVM Settings	IPT1.1cm<2.46           V         kcv. = g.d1           F(f)         0.5246           if (1)         5296           if (1)         5296	
A Device Settings	floc to exit, Jak or Corsor Nego to select	
a.0)	Desktop size: 720 x 400	
Maintenance	Refresh	
ē	Inter	rnet



KVM-over-IP Sever Management uses a dedicated RJ45 LAN port on motherboard. (Please check it with Page 28). You can also find the port position on board's illustration. The connector need be connected to a 10/100Mbps Ethernet network.

# 3.4 - Configuration

## 3.4.1 Network Configuration

### 3.4.1.1 Configure Network Interface via DHCP

By default, KVM-over-IP Sever Management configures its network interface with DHCP. When initializing, KVM-over-IP Sever Management will try to find a DHCP server in network which will provide it IP address, net mask and gateway address. It's recommended to assign KVM-over-IP Sever Management a fixed IP address according to its MAC address. You can find MAC address label on KVM-over-IP Sever Management card.

# 3.4.1.2 Configure Network Interface via TYAN<sup>®</sup> BMC utility

 $\mathsf{TYAN}^{\texttt{®}}$  provide both DOS and Linux utility to configure LAN configuration. For example, you can use uh8.exe, which is a DOS BMC utility. You can download them on  $\mathsf{TYAN}^{\texttt{®}}$  Website:

http://www.tyan.com/support\_download\_utility.aspx?model=A.M3296

🌲 M3296 Remote Console - 192.168.0.121				
Ctrl+Alt+Delete	Cptions			
LAN C	onfiguration Viewer			
Channel Number =	1			
DHCP Enable =	8			
IP Address =	192.168.000.121			
Net Mask =	255.255.255.000			
MAC Address =	00-E0-81-52-11-87			
Gateway Address =	888.888.888.888			
Gateway MAC Address =	88-88-88-88-88			
Broadcast ARP =	8			
	(1 = Enable, 0 = Disable)			
Console(Norm): Desktop size is 720 x 400	Fps: 8 ln: 515 B/s Out: 84 B/s 👔 🍡			

## 3.4.1.3 Configure Network Interface via Serial port

You need prepare another computer; connect a null modem cable between this computer and TYAN<sup>®</sup> motherboard (host system) back panel serial port.

Open the serial console software on your computer (The serial console software can be hyper terminal (Windows) or Kermit (Linux)), configure the serial port with following setting:

Parameter	Value
Baud Rate	115200
Data bits	8
Parity	No
Stop bits	1
Flow Control	none

OM1 Properties		?
Port Settings		
<u>B</u> its per second:	115200	~
<u>D</u> ata bits:	8	~
Parity:	None	~
<u>S</u> top bits:	1	~
<u>F</u> low control:	None	~
L	<u>R</u> estore	e Defaults
	Cancel	

Remove the host system power first. Connect power supply cable, and then press ESC key on remote computer immediately. If successfully, you will see "=>" prompt on serial console:



Type "config" and press "Enter" in serial console, wait a while, then you will be brought to a configuration environment.



## 3.4.1.4 Configure Network Interface with other IPMI software

You can use any IPMI software, such as IPMITool and IPMIUtil to do KVM-over-IP Sever Management LAN configuration.

# 3.4.2 Configure Video Console

KVM-over-IP Sever Management supports host video resolution up to 1280X1024@60Hz and high color. To reduce network traffic, you can configure the video console setting in web pages.



# 3.4.3 Configure Keyboard/Mouse

The proper configuration of a remote mouse is somewhat difficult to understand unless you know some underlying concepts. Basically mouse transmits their movement using two methods: either absolute or relative mode.

Absolute mode means that the mouse transmits absolute co-ordinates to KVMover-IP Sever Management .This is information like: "I am moving to screen coordinates X, Y". This mode is very easy to track and most modern Windows versions (XP, 2000, 2003) as well as Mac OS X use this. This mode is also easiest for KVM-over-IP Sever Management to track.

The second mode is "relative mode". In this case the mouse transmits information like "I am moving 97 pixels vertically and 88 pixels horizontally from my previous position". This is much more difficult to track. Firstly KVM-over-IP Sever Management has to know the starting point of the movement (hence you need to press a special Synchronize Button, which allows KVM-over-IP Sever Management to enquire the starting point of the mouse). Secondly a lot of other factors come into play like the mouse acceleration which can be different on the remote system and the system you are using to talk to KVM-over-IP Sever

Management. Hence KVM-over-IP Sever Management has to do a lot more conversion work to track the mouse than using absolute mode.

Relative mode is used by most Linux Systems and older operating system like Windows 95/98. Therefore you need to select "Other Operating Systems" if your PC uses this mode.



## 3.4.3.1 Remote Mouse Settings

A common problem with KVM devices is the synchronization between the local and remote mouse cursors. KVM-over-IP Sever Management addresses this situation with an intelligent synchronization algorithm. There are three mouse modes available on KVM-over-IP Sever Management:

#### Auto Mouse Speed

The automatic mouse speed mode tries to detect the speed and acceleration settings of the host system automatically. See the section below for a more detailed explanation.

#### **Fixed Mouse Speed**

This mode just translates the mouse movements from the Remote Console in a way that one pixel move will lead to n pixel moves on the remote system. This parameter n is adjustable with the scaling. It should be noted that this works only when mouse acceleration is turned off on the remote system.

Single/Double Mouse Mode

This mode is described in the Section called Single and Double Mouse Mode.

## 3.4.3.2 Auto Mouse Speed and Mouse Synchronization

The automatic mouse speed mode performs the speed detection during mouse synchronization. Whenever the mouse does not move correctly, there are two ways for re-synchronizing local and remote mouse:

#### Fast Sync

The fast synchronization is used to correct a temporary but fixed skew. Choose this option from the Remote Console Options menu (entry: Mouse Handling). If defined you may also press the mouse synchronization hotkey sequence

#### Intelligent Sync

If the Fast Sync does not work or the mouse settings have been changed on the host system, use the Intelligent Synchronization, instead. This method adjusts the parameters for the actual movement of the mouse pointer so that the mouse pointer is displayed at the correct position on the screen. This method takes more time than the Fast Sync and can be accessed with the appropriate item in the Remote Console Option menu (entry: Mouse Handling).

Furthermore, the shape of the mouse pointer has a significant influence on the pointer detection. We recommend use a simple, but common pointer shape. In most cases, the detection and synchronization of animated pointer shapes is likely to fail. In general, pointer shapes that change during the pointer detection process are rather impossible to figure out in the transferred video picture. With the usage of a standard mouse pointer shape the detection is rather simple and the synchronization is at its best.

The Sync Mouse button on top of the Remote Console can behave differently, depending on the current state of mouse synchronization. Usually pressing this button leads to a Fast Sync, except in situations where the KVM port or the video mode changed recently.

## 3.4.3.3 Host System Mouse Settings

The host's operating system knows various settings for the mouse driver. While KVM-over-IP Sever Management works with accelerated mouse and is able to synchronize the local with the remote mouse pointer, there are the following limitations which may prevent this synchronization from working properly:

### Special Mouse Driver

There are mouse drivers which influence the synchronization process and lead to desynchronized mouse pointers. If this happens, make sure you do not use a special vendor-specific mouse driver on your host system.

### Windows 2003 Server/XP Mouse Settings

Windows XP knows a setting named "improve mouse acceleration" which has to be deactivated.

Active Desktop

If the Active Desktop feature of Microsoft Windows is enabled, do not use a plain background. Instead, use some kind of wallpaper. As an alternative, you could also disable the Active Desktop completely.

Navigate your mouse pointer into the upper left corner of the applet screen and move it slightly forth and back. Thus the mouse will be resynchronized. If re-synchronizing fails, disable the mouse acceleration and repeat the procedure.

# 3.4.3.4 Single and Double Mouse Mode

The above information applies to the Double Mouse Mode where remote and local mouse pointers are visible and need to be synchronized. KVM-over-IP Sever Management also features another mode, the Single Mouse Mode, where only the remote mouse pointer is visible. Activate this mode in the Remote Console and click into the window area. The local mouse pointer will be hidden and the remote one can be controlled directly. To leave this mode it is necessary to define a mouse hotkey in the Remote Console Settings Panel Press this key to free the captured local mouse pointer.

## 3.4.3.5 Recommended Mouse Settings

For the different operating systems we can give the following advice:

MS Windows 2000, 2003, XP (all versions)

For a PS/2 mouse choose Auto Mouse Speed. For XP disable the option "enhance pointer precision" in the Control Panel.



## Note:

The remote mouse is always synchronized with the local mouse if selecting the option "MS Windows 2000 or newer".

SUN Solaris

Adjust the mouse settings either via "xset m 1" or use the CDE Control Panel to set the mouse to "1:1, no acceleration". As an alternative you may also use the Single Mouse Mode.

## MAC OS X

We recommend using the Single Mouse Mode.

Linux

First, choose the option "Other Operating Systems" from the Mouse Type selection box. Second, choose the option Auto Mouse Speed. This applies for both USB and PS/2 mouse.

# 3.4.4 Reset KVM-over-IP Sever Management to factory default

You can use serial console to reset KVM-over-IP Sever Management setting to factory default. Connect the power supply cable, press ESC key, then you will see "=>" prompt (detail procedure refer to step in "Configure Network Interface with Serial Console"). Type "defaults" and press Enter, KVM-over-IP Sever Management will reboot. Wait a while, KVM-over-IP Sever Management will return the factory default state.



# 3.5 - menu option

## 3.5.1 Remote Video Console

In KVM-over-IP Sever Management home page, you can click **Console** at the top left corner or "Click to open" to open the remote video console.

🗿 Home - Microsoft Internet Expl	prer	
Eile Edit View Favorites Tools	Help	
🄇 Back 🝷 🕥 - 💌 😰 🦿	🔓 🔎 Search 👷 Favorites 🤣 😥 - 🌉 🕅 - 🔜 🏭 🥸	
Address 🕘 http://192.168.0.121/home.	asp	🔁 Go Links »
KAN E		A Logout
Remote Control	Remote Console Preview	
	NATE Report To the State	
Virtual Media	Twent Univer and The Internation SIR Univer and The Internation	
System Health	Thath Finance. 7778.8.1.8.1.9188.80 ENGLARD TAILORD TAILORD TAILORD TAIL TAIL TAIL TAIL TAIL TAIL TAIL TAIL	
User Management	Tpace Left + 2 	
KVM Settings	ITT: Rev 2 2 48 10 Eve 2 4 60 10 Eve 4 60 10 Eve 4 60 10 Eve 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	
Device Settings	rise to exity the or General Reys to select Desktop size: 720 x 400	
Maintenance	Refresh	
<u>କ</u>	🗖 Toha	rnet

### Video Console Control Bar

Ctl+Alt+Delete:

Ctrl+Alt+Delete

Special button key to send the "Control Alt Delete" key combination to the remote system.

Virtual Disk:

Button to open the Virtual Disk Panel.

Option: Options

You can click this button to open Option Menu

When you choose option "Other Operating Systems" in mouse setting, the following icons will be visible:

Sync Mouse:

Sync Sync

Choose this option in order to synchronize the local with the remote mouse cursor. This is especially necessary when using accelerated mouse settings on the host system.

Single and Double Mouse:



## 3.5.2 - Virtual Media

Via KVM-over-IP Sever Management, you can redirect remote physical floppy, CD/DVD driver, hard disk and removable driver or their file image to host system. These drivers are emulated as USB driver on host system.

## 3.5.2.1 Floppy Image

In following page, you can specify Floppy Image to be emulated as Floppy Disk. You can specify up to two images and the maximum file size is 1.44MB. There're two steps.

First, click on the button "Browse", open the file selection dialog and select the desired image file. Secondly, click on the button "Upload" to initiate the transfer of the chosen image file into KVM-over-IP Sever Management on-board memory. This image file is kept in the on-board memory of KVM-over-IP Sever Management until the end of the current session, until you logged out or initiated a reboot of KVM-over-IP Sever Management.



## 3.5.2.2 CD-ROM Image

🗿 Home - Microsoft Internet Explorer		- 6 🛛
Ele Edit View Favorites Tools Help		
🕞 Back 🔹 🕥 - 💽 🗟 🏠 🔎 Search 📩	Pavorites 🚱 🍰 🗹 👻 🛄 🖓	
Address		🛃 Go Links 🎇
Kome Console	Remote Console disconnected	A Logout
Remote Control	Active Image - Drive 1	
	No disk emulation set.	
CD-ROM Image		
O Drive Redirection	Image on Windows Share	
Options System Health	This option allows you to share a CD-ROM image over a Windows Share with a maximum size of 800 MB. This image will be emulated to the host as USB device.	
User Management	Virtual Drive Drive 1 💌	
KVM Settings	Share host	
Device Settings	Share name	
Maintenance	Path to image	
79	User (optional)	
	Password (optional)	
	Ser	
A http://102.168.0.123/urdam.arg		roat

If you want to use image file size over 1.44MB, you could use CD-ROM image via Windows Files Share or SAMBA on Linux. In this case, maximum file size is 800MB. The following information has to be given to mount the selected image properly:

Share host

The server name or its IP address. On Windows 95, 98 and Windows ME do not specify the IP address, but the server name ("NetBIOS Name").

Share name The name of the share to be used.

Path to image The path of the image files on the share.

User (optional)

If necessary, specify the user name for the share named before. If unspecified and a guest account is activated, this guest account information will be used as your login.

Password (optional) If necessary, specify the password for the given user name.

For an example you may have a look at the previous image: KVM-over-IP Sever Management will look for a server named "192.168.168.97". Then, the entered share name is selected (in our example we use the share "storage") and the image file "\cdrom\_image.iso" is opened. If this file can only be accessed with both users name and password enter the according values in the input fields for user name and password. In our case the file is owned by the user "raphaeld" and protected by an user-specific pass-phrase (displayed as a number of stars). Then you need click button "Set" to register the specified file image and its location.

The specified image file is supposed to be accessible from KVM-over-IP Sever Management. The information above has to be given from the point of view of KVM-over-IP Sever Management. It is important to specify correct IP addresses or device names. Otherwise, KVM-over-IP Sever Management may not be able to access the referenced image file properly, leave the given file un-mounted and will display an according error message, instead. So, we recommend to state correct values and repeat this step if necessary.

## 3.5.2.3 Drive Redirection

If you want physical drive, include floppy, hard disk, CD-ROM or USB stick, on your client computer, to be used on remote host system, you could use drive redirection to emulate up to two virtual USB disks. The drivers are shared over TCP network connection. Open the Drive Redirection Panel in Video Console, you can see following image:

			Drive	Redirection	
Drive 1:	Connect Drive	Connect ISO	Disconnect	Not connected	
Cancelled	Drive redirection				
Drive 2:	Connect Drive	Connect ISO	Disconnect	Not connected	

Click button "Connect Drive", you can open the dialog to specify the drive you want to share. You can even enable writing support so that remote host can write data on your local computer disk. The life time of drive redirection is same with Video Console. It is to say, connection will be kept until the Remote Video Console is closed.

🐐 Select a drive to redirect		
A: (Removable)	Refresh List	
A: (Removable) C: (Hard Disk) D: (CD-ROM)	Cancel	

Please note that Drive Redirection works on a level which is far below the operating system. That means that neither the local nor the remote operating

46	
http://www.tv	van.com

system is aware that the drive is currently redirected, actually. This may lead to inconsistent data as soon as one of the operating systems (either from the local machine, or from the remote host) is writing data on the device. If write support is enabled the remote computer might damage the data and the file system on the redirected device. On the other hand, if the local operating system writes data to the redirected device the drive cache of the operating system of the remote host might contain older data. This may confuse the remote host's operating system. We recommend using the Drive Redirection with care, especially the write support.

## 3.5.3 - System Health

### 3.5.3.1 Chassis Control

In "Chassis Control" page, you can:

- Monitor system power status
- Power on/off host system
- Flash ID LED and locate host chassis
- Lock local front panel power/reset button
- Clear CMOS.



## 3.5.3.2 Monitor Sensors

If you use the motherboard specified firmware, you could get sensors reading in this page. With factory default firmware, this page will be empty.

Home - Microsoft Internet Explorer					
<u>File E</u> dit <u>V</u> iew F <u>a</u> vorites <u>T</u> ools <u>H</u> elp					
🌀 Back 👻 🕥 - 💌 🗟 🏠 🔎 See	arch 📌 Favorite	es 🥝 🎯 👌	🎍 🗷 • 🗖	J 🛍 🦓	
Address 🕘 http://192.168.0.121/home.asp				💌 🄁 Go	o Links »
Home Console					A Logout
	Monitoring S	ensors ———			_
Remote Control	Sensor Type	Sensor Name	Sensor Status	Sensor Reading	
	Fan	CPU FAN	Ok	2430 (+/- 45) RPM	
Virtual Media	Fan	SYSTEM FAN 2	No reading		
Sustem Health	Fan	SYSTEM FAN 3	No reading		
System Health	Fan	SYSTEM FAN 4	No reading		
😔 Chassis Control	Fan	SYSTEM FAN 5	No reading		
Monitor Sensors	Fan	SYSTEM FAN 6	No reading		
😊 System Event Log	Voltage	CPU Core Volt	Ok	1.275 (+/- 0.006) Vol	ts
<ul> <li>Alert Settings</li> </ul>	Voltage	DDR 1.8V	Ok	1.820 (+/- 0.013) Vol	ts
() User Management	Voltage	System 1.25V	Ok	1.235 (+/- 0.007) Vol	ts
<u></u>	Voltage	System 3.3V	Ok	3.192 (+/- 0.008) Vol	ts
KVM Settings	Voltage	System 5V	Ok	4.940 (+/- 0.013) Vol	ts
	Voltage	3.3V Standby	Ok	3.158 (+/- 0.008) Vol	ts
Device Settings	Voltage	System 12V	Ok	12.159 (+/- 0.032) Vi	olts
C Maintananaa	Temperature	CPU Temp	Ok	67 (+/- 0.500) degree	es C
Wainternance	Temperature	System Temp	Ok	30 (+/- 0.500) degree	es C
		F	efresh		
ê				🔮 Internet	

## 3.5.3.3 System Event Log

These logs are IPMI events. They're different with KVM-over-IP Sever Management own system logs.



## 3.5.3.4 Alert Settings

In this page, you can configure the IPMI PEF settings; include filters, policies and destinations.

Home - Microsoft Internet Explore	90													
ile Edit Yiew Favorites Iools He	ql													
🌏 Back 🝷 🕥 - 💌 📓 🏠	🔎 Search 💉	Favorites	🖌 🚱		• 🗾	12 3								
idress 🕘 http://192.168.0.123/home.asp												× 🖻	Go	Links
Home Console							R	emot	e Consol	e disconr	iected!		L	A ogot
Remote Control		Alert Conf	iguration —		[ <u>Filt</u> e	r <u>List]</u> [Po	licy Li	<u>st ]</u>	[LAN	l Destir	ation Li	<u>st ]</u>		
Virtual Media		Filter List			· · · · ·		Ganar	ator	Sancar	Sancar		Offeat	-	_
System Health	Index	Status	Filter Type	Action	Policy#	Severity	ID	2101	Туре	No	Trigger	Mask	Data	1
Charrie Control	1	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00 0	0 0
Monitor Sensors	2	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00 0	0 0
System Event Lon	3	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00 0	0 0
Alert Settings	4	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00 0	0 0
All the second	5	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00 0	0
User Management	6	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00 0	0 0
K)/M Sottings	7	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00 0	0
Ryw Settings	8	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00 0	0
Device Settings	9	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00 0	0
2	10	disabled	configurable	-	0	unspecified	00	00	00	00	00	0000	00 0	0
/ Maintenance	11	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00 0	0
	12	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00 0	0
	13	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00 0	0
	14	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00 0	0
	15	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00 0	0
	16	disabled	configurable		0	unspecified	00	00	00	00	00	0000	00 0	0
													iee la	
Applet op op vo RemoteCoproleApplet sta	rtad							_	1	1	-	Internet		-

# 3.5.4 User Management 3.5.4.1 Change Password

You can change your current user's password here.

🚰 Home - Microsoft Internet Explorer	
Ele Edt View Favorites Iools Help	
🚱 Back + 🐑 - 🖹 🛃 🏠 🔎 Search 👷 Favorites 🤣 🍙 - چ 🔟 + 🦲 🏭 🔏	
Address 🗃 http://192.168.0.123/home.asp	🖌 🛃 Go 🛛 Links 🌺
Home Console	A Logout
Remote Control   Virtual Media   System Health   User Management   Othange Password   Othange P	
	Internet

## 3.5.4.2 Users and Groups

🗿 Home - Microsoft Internet Explor	er 🗧 🖻 🔀
Eile Edit Yiew Favorites Iools H	de 💦
🚱 Back 🔹 🕥 🕤 🖹 🛃 🏠	🔎 Search 👷 Favorites 🤣 😥 - 🥁 🕅 - 🛄 🎇 🦓
Address a http://192.168.0.121/home.as	) 💽 🄁 Go Links 🎽
Home Console	A Logout
Remote Control     Virtual Media     System Health     User Management     Change Pasword     Users & Groups     Permissions     KVM Settings     KVM Settings     Device Settings     Maintenance	User Management Existing users select Cookup New user name Full user name Password Confirm Password Confirm Password Confirm Password Email address Mobile number Group menership (Unknown) (default setting) V Enforce user to change password on next login " Create Group Management Existing groups select V New group name Cookup New group name
🔊 http://192.168.0.121/um.asp	

Existing users

Select an existing user for modification. Once a user has been selected, click the lookup button to see the user information.

New User name

The new user name for the selected account.

Password

The password for the login name. It must be at least four characters long.

Confirm password Confirmation of the password above.

Email address This is optional.

Mobile number This information may be optionally provided.

Role

Each user can be a member of a group (named a "role") - either an administrator, or a regular user. Choose the desired role from the selection box.

To create an user press the button "Create". The button "Modify" changes the displayed user settings. To delete an user press the button "Delete".

## 3.5.4.3 Permissions

This page allows you to set the permissions for each user or group. You select the item (user and/or group) from the drop-down menu. All changes you make then affect the permission set of the selected entity. The user can only access and use the selected function if the permissions field is set to "yes".



### 3.5.5 KVM Setting 3.5.5.1 User Console

The following settings are user specific. That means the super user can customize these settings for every user. Changing the settings for one user does not affect the settings of other users.



### **Remote Console Settings for Users**

This selection box displays the user ID for which the values are shown and for which the changes will take effect. Select the desired user from the selection box and press the button "Update". This will result in displaying the according user settings below.

#### **Transmission Encoding**

The Transmission Encoding setting allows changing the image-encoding algorithm that is used to transmit the video data to the Remote Console window. It is possible to optimize the speed of the remote screen depending on the number of users working at the same time and the bandwidth of the connection line (Modem, ISDN, DSL, LAN, etc.).

#### Automatic detection

The encoding and the compression level is determined automatically from the available bandwidth and the current content of the video image.

### Pre-configured

The pre-configured settings deliver the best result because of optimized adjustment of compression and color depth for the indicated network speed.

### Manually

Allows to adjust both compression rate and the color depth individually. Depending on the selected compression rate the data stream between KVMover-IP Sever Management and the Remote Console will be compressed in order to save bandwidth. Since high compression rates are very time consuming, they should not be used while several users are accessing KVMover-IP Sever Management simultaneously.

The standard color depth is 16 Bit (65536 colors). The other color depths are intended for slower network connections in order to allow a faster transmission of data. Therefore compression level 0 (no compression) uses only 16 Bit color depth. At lower bandwidths only 4 Bit (16 colors) and 2 Bit (4 gray scales) are recommended for typical desktop interfaces. Photo-like pictures have best results with 4 Bit (16 gray scales). 1 Bit color depth (black/white) should only be used for extremely slow network connections.

### **Remote Console Type**

Specifies which Remote Console Viewer to use.

Default Java Virtual Machine (JVM)

Uses the default JVM of your web browser. This may be the Microsoft JVM for the Internet Explorer or the Sun JVM if it is configured this way. Use of the Sun JVM may also be forced (see below).

Sun Microsystems Java Browser Plugin

Instructs the web browser of your administration system to use the JVM of Sun Microsystems. The JVM in the browser is used to run the code for the Remote Console window which is actually a Java Applet. If you check this box for the first time on your administration system and the appropriate Java plug-in is not yet installed on your system, it may be downloaded and installed automatically. However, in order to make the installation possible, you still have to answer the according dialogs with "yes". The download volume is around 11 Mbytes. The advantage of downloading Sun's JVM is the usage of a stable and identical JVM across different platforms. The Remote Console software is optimized for this JVM version and offers a wider range of functionality when run in SUN's JVM.

### Miscellaneous Remote Console Settings

Start in Monitor Mode

Sets the initial value for the monitor mode. By default the monitor mode is disabled. In case you switch it on, the Remote Console window will be started in a read only mode.

### Start in Exclusive Access Mode

Enables the exclusive access mode immediately at Remote Console startup. This forces the Remote Consoles of all other users to close. Nobody else can open the Remote Console at the same time again until you disable this feature or log off.

### Mouse Hotkey

Allows to specify a hotkey combination which starts either the mouse synchronization process if pressed in the Remote Console or is used to leave the single mouse mode. This is only available if you have selected the Mouse Mode "Other Operating System".

## **Remote Console Button Keys**

Button Keys allow simulating keystrokes on the remote system that cannot be generated locally. The reason for this might be a missing key or just the fact that the local operating system of the Remote Console is unconditionally catching this keystroke already. Typical examples are "Control+Alt+Delete" on Windows and DOS, that is always caught, or the key sequence "Control+Backspace" on Linux that can be used for terminating the X-Server.

In order to define a new Button Key or to adjust an existing one have a look at the rules that describes the setting for a key. In general, the syntax for a key is as follows:

[confirm] <key code>[+|-|>[\*]<key code>]\*

A term in brackets is optional. The star at the end means that you add further keys as often as required for your case. The term "confirm" adds a confirmation dialogue that is displayed before the key strokes will be sent to the remote host.

The "key code" is the key to be sent. Multiple key codes can be concatenated with either a plus, a minus, or an ">" sign. The plus sign builds key combinations - all the keys will be pressed until a minus sign or the end of the combination is encountered. In this case all pressed keys will be released in reversed sequence. So, the minus sign builds single, separate key presses and key releases. The ">" sign releases the last key, only. The star inserts a pause with duration of 100 milliseconds.

As an example, the key combination of Ctrl, Alt and F2 is represented by the sequence Ctrl+Alt+F2.

# 3.5.5.2 Keyboard and Mouse



### **Key Release Timeout**

This is an important option if you are accessing KVM-over-IP Sever Management over a slow or congested network. In such a situation you transmit a network packet containing the key PRESS to KVM-over-IP Sever Management. When you release the key, then KVM-over-IP Sever Management will receive a corresponding RELEASE packet. When the network is slow then it takes too long for the RELEASE packet to arrive. This might mislead KVM-over-IP Sever Management to replicate the key pressing, this is like you holding down the desired key.

The Key Release Timeout in milliseconds tells KVM-over-IP Sever Management to consider the key released, even if no RELEASE packet has arrived. This avoids keys being unwantedly repeated.

### **USB Mouse Type**

Enables the USB mouse type. Choose an appropriate option from the selection box. Choose between "MS Windows 2000 or newer" for MS Windows 2000, 2003 Server, XP, or "Other Operating Systems" for MS Windows NT, Linux, or OS X.

In "MS Windows 2000 or newer" mode the remote mouse is always synchronized with the local mouse. For a detailed description about the mouse type and recommended options for the different operating systems see the Section called Recommended Mouse Settings.

### **Mouse Speed**

#### Auto mouse speed

Use this option if the mouse settings on the host use an additional acceleration setting. KVM-over-IP Sever Management will try to detect the acceleration and speed of the mouse during the mouse sync process.

#### Fixed mouse speed

Use a direct translation of mouse movements between the local and the remote pointer.

You may also set a fixed scaling which determines the amount the remote mouse pointer is moved when the local mouse pointer is moved by one pixel. This option only works when the mouse settings on the host are linear. This means that there is no mouse acceleration involved.

To set the options click on the button "Apply".

## 3.5.6 Device Settings

## 3.5.6.1 Network Settings

Following is Network Setting Panel, you can change network related parameter here. If click the "Apply" button, the new networking setting will take effect immediately. As changing the KVM-over-IP Sever Management network setting may cause connection lost, please be careful.



### **Basic Network Settings**

#### IP auto configuration

With this option you can define if the KVM-over-IP Sever Management should fetch its network settings from a DHCP or BOOTP server. For DHCP select "dhcp" and for BOOTP select "bootp" accordingly. If you choose "none" then IP auto configuration is disabled.

### Preferred host name

Preferred host name to request from DHCP server. Whether the DHCP server takes the KVM-over-IP Sever Management's suggestion into account or not depends on the server configuration.

IP address

IP address in the usual dot notation.

Subnet Mask The net mask of the local network.

Gateway IP address

In case the KVM-over-IP Sever Management should be accessible from networks other than the local one, this IP address must be set to the local network router's IP address.

#### Primary DNS Server IP Address

IP address of the primary Domain Name Server in dot notation. This option may be left empty,however the KVM-over-IP Sever Management will not be able to perform name resolution.

Secondary DNS Server IP Address

IP address of the secondary Domain Name Server in dot notation. It will be used in case the Primary DNS Server cannot be contacted.

#### **Miscellaneous Network Settings**

Remote Console and HTTPS port

Port number at which the KVM-over-IP Sever Management Remote Console server and HTTPS server are listening. If left empty, the default value (port 444) will be used.

HTTP port

Port number at which the KVM-over-IP Sever Management HTTP server is listening. If left empty, the default value(port 80) will be used.

Telnet port

Port number at which the KVM-over-IP Sever Management Telnet server is listening. If left empty, the default value (port 25) will be used.

SSH port

Port number at which the KVM-over-IP Sever Management SSH (Secure SHell) server is listening. If left empty, the default value (port 22) will be used.

Bandwidth Limit

The maximum network traffic generated through the KVM-over-IP Sever Management Ethernet device. Value in Kbit/s.

Enable Telnet This enables the Telnet client mode.

Enable SSH This enables the SSH (Secure SHell) client mode.

Disable Setup Protocol Enable this option to exclude the KVM-over-IP Sever Management from the setup protocol.

### LAN Interface Settings

This entry field displays the current settings for the Ethernet/LAN interface of the OPMA module. You may choose between auto negotiation and a fixed setting for the Ethernet transceiver settings "interface speed" and "duplex mode" in case auto negotiation does not work correctly.

### LAN interface speed

Depending on your network connection you may select an according speed value for this interface. To adjust the interface automatically, choose "auto detect" (default value). If this selection results in misbehavior of the interface, choose one of other speed options to work with. The interface will transmit and receive data with that fixed speed.

#### LAN interface duplex mode

If necessary you may also select a specific duplex mode. The default value is set to "auto detect" which leads to an automatic setting of the duplex mode depending on your network (recommended). As an alternative you may explicitly set the interface to either "half duplex" or "full duplex" mode

# 3.5.6.2 Dynamic DNS

A freely available Dynamic DNS service (dyndns.org) can be used

🗿 Home - Microsoft Internet Exp	plorer	
Ele Edit View Favorites Iools	Help	<b></b>
🚱 Back 🔹 🕥 🕤 📓 🚺	🏠 🔎 Search 👷 Favorites 🤣 😥 - 🌺 😥 - 🛄 🏭 🔏	
Address 🕘 http://192.168.0.123/home	e. asp	💌 🛃 Go 🛛 Links 🌺
		A
Home Console	Remote Console disconnected!	Logout
Remote Control	Dynamic DNS Settings	
	Enable Dynamic DNS *	
🔿 Virtual Media	Dynamic DNS server www.dyndns.org	
	DNS System Dynamic 🚩	
System Health	Hostname (eg. yourhost.dyndns.com)	
() User Management	Usemame	
	Password	
KVM Settings	Check time (HH:MM)	
Device Settings	Check interval 24h	
<ul> <li>Network</li> </ul>	Delete saved external IP	
Dynamic DNS		
<ul> <li>Security</li> </ul>	Apply Reset to defaults	
<ul> <li>Certificate</li> </ul>	* Stored value is equal to the default.	
OUSB		
O Date/Time		
Event Leg		
SNMP Settings		
A Maintenance		
29		
http://192.168.0.123/dyndns.asp		Internet

# 3.5.6.3 Security



### **HTTP Encryption**

If "Force HTTPS" option is enabled, access to the web front-end is only possible using a HTTPS connection. KVM-over-IP Sever Management will not listen on the HTTP port for incoming connections. In case you want to create your own SSL certificate that is used to identify the KVM-over-IP Sever Management refer to the Section called Certificate.

#### **KVM Encryption**

This option controls the encryption of the RFB protocol. RFB is used by the Remote Console to transmit both the screen data to the administrator machine and keyboard and mouse data back to the host.

If set to "Off", no encryption will be used. If set to "Try", the applet will try to make an encrypted connection. In case that the connection cannot be established an unencrypted connection will be used instead. If set to "Force" the applet tries to make an encrypted connection. An error will be reported in case the connection establishment fails.

#### **IP Access Control**

This allows you to set an IP address policy in order to specify which networks

are allowed to access KVM-over-IP Sever Management. Make sure you press "Apply" to save and enable your changes.

#### Group Based System Access Control

This is similar to the option above, except that you can specify a group of IP addresses and not a network with a network mask.

#### User Blocking

When someone attempts to login to KVM-over-IP Sever Management and fails, you can specify how many failed login attempts the OPMA module should tolerate before waiting for the specified number of "Block Time" minutes before it allows further logins. This is useful for blocking automated hacking and cracking attempts.

#### Login Limitations

You can specify if only a single user is allowed to login to the OPMA module at one time. Note that if you do so, this greatly reduces the usefulness, for

example the chat window, because you can then only talk to yourself. Also if another administrator is logged in from a different location, then you will be blocked accessing the KVM-over-IP Sever Management.

Password aging is the time interval at which users are required to change the password. Some systems refer to this as "Password Expiry".

# 3.5.6.4 Certificate

🗿 Home - Microsoft Internet Explorer		
Ele Edit View Favorites Icols Help		<u></u>
🚱 Back 🔹 🐑 🔹 😭 🔎 Search	📌 Favorites 🚱 🔗 è 🌺 🗹 • 🛄 🇱 🖓	
Address (a) http://192.168.0.123/home.asp	· · · · · · · · · · · · · · · · · · ·	🖌 🛃 Go 🛛 Links 🂙
Kine Console	Remote Console disconnected!	A Logout
Remote Control         Virtual Media         System Health         User Management         KVM Settings         Device Settings         Network         Opnamic DNS         Security         Cate/Time         Authentication         Stude/Time         Subsections	Certificate Signing Request (CSR) Common name Organizational unit Organization Locality/City State/Province Country (ISO code) Email Challenge password Key length (Dids) T024 ¥ + Ercente * Stored value is equal to the default.	
Maintenance     Applet nn.pp.rc.RemoteConsoleApplet started		ternet

The KVM-over-IP Sever Management uses the Secure Socket Layer (SSL) protocol for any encrypted network traffic between itself and a connected client. During the connection establishment, KVM-over-IP Sever Management has to expose its identity to a client using a cryptographic certificate. Upon delivery this certificate and the underlying secret key is the same for all KVM-over-IP Sever Management ever produced and certainly will not match the network configuration that will be applied to the KVM-over-IP Sever Management cards by its user. The certificate's underlying secret key is also used for securing the SSL handshake. Hence, this is a security risk (but far better than no encryption at all).

However, it is possible to generate and install a new base64 x.509 certificate that is unique for a particular KVM-over-IP Sever Management card. In order to do that, the OPMA module is able to generate a new cryptographic key and the associated Certificate Signing Request (CSR) that needs to be certified by a certification authority (CA). A certification authority verifies that you are the person who you claim you are and signs and issues a SSL certificate to you.

To create and install a SSL certificate for KVM-over-IP Sever Management the following steps are necessary:

1. Create a SSL Certificate Signing Request. You need to fill out a number of fields that are explained below. Once this is done, click on the button "Create" which will initiate the Certificate Signing Request generation. The CSR can be downloaded to your administration machine with the "Download CSR" button.

2. Send the saved CSR to a CA for certification. You will get the new certificate from the CA after a more or less complicated traditional authentication process (depending on the CA).

3. Upload the certificate to the OPMA module using the "Upload" button.

After completing these three steps, KVM-over-IP Sever Management has its own certificate that is used for identifying the card to its clients.

#### Common name

This is the network name of KVM-over-IP Sever Management once it is installed in the user's network (usually the fully qualified domain name). It is identical to the name that is used to access KVM-over-IP Sever Management with a web browser but without the prefix "http://". In case the name given here and the actual network name differ, the browser will pop up a security warning when KVM-over-IP Sever Management is accessed using HTTPS.

#### Organizational unit

This field is used for specifying to which department within an organization the KVM-over-IP Sever Management host system belongs.

Organization

The name of the organization to which the KVM-over-IP Sever Management host system belongs.

Locality/City The city where the organization is located.

State/Province

The state or province where the organization is located.

Country (ISO code)

The country where the organization is located. This is the two-letter ISO code, e.g. DE for Germany, or US for the U.S.

Challenge Password

Some certification authorities require a challenge password to authorize later changes on the certificate (e.g. revocation of the certificate). The minimal length of this password is four characters.

Confirm Challenge Password
Confirmation of the Challenge Password.

Email

The email address of a contact person that is responsible for the KVM-over-IP Sever Management host system and its security.

Key length

This is the length of the generated key in bits. 1024 Bits are supposed to be sufficient for most cases. Longer keys may result in slower response time of the OPMA module during connection establishment.

## 3.5.6.5 USB Setting

In some case, OS and BIOS driver cannot handle USB emulation driver on KVM-over-IP Sever Management well. For example, installing RHEL4 U4 via USB CDROM on Nvidia<sup>®</sup> chipset board, Linux kernel will hang up during booting. You have to disable high speed USB mode and use full speed mode. This approach has a disadvantage, disk emulation will get slower. So we disable this option by default.



## 3.5.6.6 Date and Time

In this panel, you can set up where the internal real time clock of KVM-over-IP Sever Management comes from. You have the possibility to adjust the clock manually or to use a NTP time server. Without a time server your time setting will not be persistent, so you have to wait BIOS to adjust it again after KVM-over-IP Sever Management loses power for more than a few minutes(Our motherboard BIOS will set its time to KVM-over-IP Sever Management). To avoid this you can use a NTP time server which sets up the internal clock automatically to the current UTC time. Because NTP server time is always UTC, there is a setting that allows you to set up a static offset to get your local time.

🗿 Home - Microsoft Internet Explorer	
Elle Edit View Favorites Iools Help	<u></u>
🚱 Back 🔹 💿 · 💌 🗟 🏠 🔎 Search 📌 Favorites 🚱 🎯 ·	🎍 🔟 · 📙 🇱 🦀
Address ahttp://192.168.0.123/home.asp	🔽 🔁 Go Links 🎽
Home Console	Remote Console disconnected
Remote Control         Virtual Media         System Health         User Management         Wier Management         Device Settings         Device Settings         Network         Oparamic DNS         Security         Cartificate         USB         Date         StateTime         Authentication         Security         StMP Settings	Time Settings         Cr Offset +2 0 h x +         ter specified time *         tate 10 / 9 / 2007 (mm/dd/yyyy)         ime 6 : 137 : 9 (mm/dd/yyyy)         ime 7 (mm/dd/yyyyy)         ime 6 : 137 : 9 (mm/dd/yyyyy)         ime 7 (mm/dd/yyyyyy)         ime 7 (mm/dd/yyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyy
Applet nn.pp.rc.RemoteConsoleApplet started	Internet

## 3.5.6.7 Authentication Settings

You can specify where the KVM-over-IP Sever Management will look in order to authenticate the users. You can either use "Local Authentication", this means you need to have created the user account on the KVM-over-IP Sever Management and the user/group information residing on the KVM-over-IP Sever Management will be used for authentication.

The other options allow you to specify an LDAP or a RADIUS Server to use for the login authentication. These methods are very useful when you want to map users into specific groups which have certain privileges. It is usually far easier and simpler to refer to already existing groups, rather than having to re-enter everything into KVM-over-IP Sever Management.



### Note:

Whatever you configure, you can always login over the network as the user "super". The super user is always authenticated and authorized locally, so you always have a "back door" to KVM-over-IP Sever Management.

🗿 Home - Microsoft Internet Explorer				
Ele Edit Yew Favorites Iools Help				<u></u>
🚱 Back 🔹 💿 🕤 📓 🐔 🔎 Search 🕈	🛧 Favorites 🚱 🔗 🌺 👿	• 📃 🛍 🔏		
Address ahttp://192.168.0.123/home.asp				💌 🛃 Go 🛛 Links 🤇
Kine Console			Remote Console disco	nnected!
Remote Control	Authentication Settings   Local Authentication *  LDAP			
System Health	User LDAP Server Base DN of User LDAP Server Type of external LDAP Server	Generic LDAP server	*	
KVM Settings	Name of login-name attribute Name of user-entry objectclass		*	Ξ
Network     Dynamic DNS     Security	User search sublitter Active Directory Domain		*	
<ul> <li>O Certificate</li> <li>O USB</li> <li>○ Date/Time</li> </ul>	RADIUS     Server Share	d Secret Auth. Port	Acc. Timeout Port	Retries
Authentication     Event Log     SNMP Settings	1.	1812 More entries	• 1813 • 1	* 3 *
Maintenance	Apply	Reset	to defaults	Internet

69 http://www.tyan.com

# 3.5.6.8 Event Log Settings

Important events like a login failure or a firmware update are logged to a selection of logging destination. Each of those events belongs to an event group which can be activated separately. The common way to log events is to use the internal log list of the KVM-over-IP Sever Management. To show the log list, click on the item "Event Log" from the section "Maintenance". In the Event Log Settings you can choose how many log entries are shown on each page. Furthermore, you can clear the log file here.



### List logging enabled

To log events you may use the internal log list of the KVM-over-IP Sever Management. To show the log list, click on "Event Log" on the "Maintenance" page. Since the KVM-over-IP Sever Management system memory is used to save all the information, the maximum number of possible log list entries is restricted to 1,000 events. Every entry that exceeds this limit overrides the oldest one automatically.

#### NFS Logging enabled

Define a NFS server where a directory or a static link has to be exported to, in order to write all logging data to a file that is located there. To write logging data from more than one KVM-over-IP Sever Management card to only one NFS share, you have to define a file name that is unique for each device. When you

change the NFS settings and press the button "Apply", the NFS share will be mounted immediately. That means the NFS share and the NFS server must be filled with valid sources or you will get an error message.

#### SMTP Logging enabled

With this option the KVM-over-IP Sever Management is able to send Emails to an address given by the Email address text field in the Event Log Settings. These mails contain the same description strings as the internal log file and the mail subject is filled with the event group of the occurred log event. In order to use this log destination you have to specify a SMTP server that has to be reachable from the KVM-over-IP Sever Management card and that needs no authentication at all (<server ip>:<port>).

#### SNMP Logging enabled

If this is activated, KVM-over-IP Sever Management will send a SNMP trap to a specified destination IP address, every time a log event occurs. If the receiver requires a community string, you can set it in the appropriate text field. Most of the event traps only contain one descriptive string with all information about the log event. Only authentication and host power events have an own trap class that consists of several fields with detailed information about the occurred event. To receive this SNMP traps any SNMP trap listener may be used.

# 3.5.6.9 SNMP Settings

🗿 Home - Microsoft Internet Ex	oplorer 🖉 🖬 🖉
File Edit View Favorites Tools	s Help
3 Back • 🕑 • 💌 🖻	🏠 🔎 Search 👷 Favorites 🤣 🎯 - 🌉 🛍 - 🛄 🎉 🖄
Address 🙋 http://192.168.0.123/hom	ne.asp 🕑 🔂 Go Links *
Home Console	Remate Console disconnected Logout
Remote Control     Virtual Media     System Health     User Management     KrVM Settings     Nove Settings     Nove Settings     Security     Gentificate     USB     ObderTime     Authentication     Symt Log     SNM Settings	SNMP Settings         Enable SNMP Agent *         System Location         System Contact         *         Read Community         Write Community         Click here to view the SNMP MIB         Apply         * Stored value is equal to the default.
Applet nn.pp.rc.RemoteConsoleAppl	et started 🔮 Internet

The following information is available via SNMP:

71 http://www.tyan.com

- Serial number
- Firmware version
- · MAC address / IP address / Net mask / Gateway of LAN interface
- Host system power state

The following actions can be initiated via SNMP:

- Reset server
- Power on/off server
- Reset KVM-over-IP Sever Management

The following events are reported by the KVM-over-IP Sever Management via SNMP:

- · Login trial at KVM-over-IP Sever Management failed.
- · Login trial at KVM-over-IP Sever Management succeeded.
- Denying access to a particular action.
- · Host system was reset.
- · Host system was powered on/off.

### Enable SNMP Agent

If this option is checked, the KVM-over-IP Sever Management will reply to SNMP requests.

Hint: If a community is left blank, you cannot perform the according request. E.g. if you want to disable the possibility to reset KVM-over-IP Sever Management via SNMP, do not set a write community.

### Read Community

This is the SNMP community, which allows you to retrieve information via SNMP.

### Write Community

This community allows you to set options and to reset the KVM-over-IP Sever Management or the host via SNMP, i.e. all that affects the host or the KVMover-IP Sever Management.

### System Location

Enter a description of the physical location of the host. The description will be used in reply to the SNMP request "sysLocation.0".

#### System Contact

Enter a contact person for the host system. The value will be used in reply to the SNMP request "sysContact.0".

SNMP MIB

This link allows you to download the KVM-over-IP Sever Management SNMP MIB file. This file may be necessary for an SNMP client to communicate with KVM-over-IP Sever Management.

# 3.5.7 Maintenance

# 3.5.7.1 Device Information

In device information page, you can get the firmware version and build number, which will be useful to our technical support.



# 3.5.7.2 Event Log

It includes the events that are kept by KVM-over-IP Sever Management, extended by the event date, a short event description and an IP address the request was sent from.

🚰 Home - Microsoft Internet Exp	olorer			
Eile Edit View Favorites Iools	Fielb			
🌀 Back 🔹 🐑 - 💌 📓 🕯	🏠 🔎 Search 🤺 Favorites 🧐 🔗 •	🎍 🗷 • 🗔	🗱 🚳	
Address 🕘 http://192.168.0.123/hom	s.asp			💙 🛃 Go Links 🎇
Home Console			Remote Console disconnected!	Logout
	C			
Remote Control	Event Log		[ Prev II Next ]	]
	Date	Event	Description	
🔗 Virtual Media	10/09/2007 06:13:2	D Remote Console	Connection to client 192 168 0 67 closed	1
	10/09/2007 06:13:0	4 Remote Console	Connection to client 192 168 0 67 established	
System Health	10/09/2007 06:12:5	6 Remote Console	Connection to client 192.168.0.67 closed.	1
And Lines Management	10/09/2007 06:12:5	2 Remote Console	Connection to client 192.168.0.67 established.	
Oser Management	10/09/2007 06:12:4	6 Remote Console	Connection to client 192.168.0.67 closed.	
KVM Settings	10/09/2007 06:12:0	B Remote Console	Connection to client 192.168.0.67 established.	
<u></u>	10/09/2007 06:11:5	0 Authentication	User 'super' logged in from IP address 192.168.0.67	-
Provice Settings	10/09/2007 06:10:5	3 Authentication	User 'super' logged in from IP address 192.168.0.67	
10	10/09/2007 06:07:4	2 Authentication	User 'super' logged in from IP address 192.168.168.97	
K Maintenance	01/01/1970 00:11:0	6 Authentication	User 'super' logged in from IP address 192.168.168.97	
Device Information	01/01/1970 00:10:2	0 Authentication	User 'super' logged in from IP address 192.168.168.97	
e Event Log	01/01/1970 00:07:5	6 Authentication	User 'super' logged in from IP address 192.168.168.97	
- Update Firmware	01/01/1970 00:03:3	9 Authentication	User 'super' logged in from IP address 192.168.168.97	
😁 Unit Reset	01/01/1970 00:01:3	4 Authentication	User 'super' logged in from IP address 192.168.0.120	
	01/01/1970 00:00:2	2 Board Message	Device successfully started.	
	01/01/1970 00:00:2	2 Board Message	Device successfully started.	
	01/01/1970 00:00:2	2 Board Message	Device successfully started.	
	01/01/1970 00:00:2	2 Board Message	Device successfully started.	
	01/01/1970 00:00:2	0 Board Message	Device successfully started.	
	01/01/1970 00:00:2	O Roard Maccana	Nevice excrecefully started	×
Applet nn.pp.rc.RemoteConsoleApple	t started			internet

## 3.5.7.3 Update Firmware

KVM-over-IP Sever Management is a complete standalone computer. The software it runs is called the firmware. The firmware of KVM-over-IP Sever Management can be updated remotely in order to install new functionality or special features. Normally, the factory default firmware is mother board independent. If you want specified feature, such as monitoring sensors, you need update firmware.

First, click the button "Browse" and specify the firmware file you want to update. Then click button "Upload" to transfer the file to KVM-over-IP Sever Management memory. KVM-over-IP Sever Management will check if this file is a valid firmware or not.

🗿 Home - Microsoft Internet Ex	φlarer	
Eile Edit View Favorites Iool	s Help	27
🌀 Back 🔹 🕥 🕤 💌 🛃	😚 🔎 Search 🤺 Favorites 🤣 🎯 - 🍑 💓 - 📜 鑬 🦓	
Address 🕘 http://192.168.0.121/hor	ne.asp 💽	🗲 Go Links 🎽
Home Console		A Logout
Remote Control	Firmware Upload	
Virtual Media		
System Health		
User Management		
KVM Settings		
Device Settings		
Maintenance		
<ul> <li>Device Information</li> </ul>		
😁 Event Log		
e Update Firmware		
Omeneste		
ê	🐲 Interne	et , j

Secondly, if everything went well, you will see the Update Firmware panel. The panel shows you the version number of the currently running firmware and the version number of the uploaded firmware. Pressing the button "Update" will store the new version and substitute the old one completely.



Firmware updating is very critical. During this step, please make sure power supply will not be interrupted. Otherwise, KVM-over-IP Sever Management will become unusable.



Thirdly, after the firmware has been stored, KVM-over-IP Sever Management will reset automatically. After about one minute you will be redirected to the Login page and requested to login once again.



## 3.5.7.4 Unit Reset

This section allows you to reset specific parts of the device. This involves the both keyboard and mouse, the video engine and the KVM-over-IP Sever Management itself. Resetting the card itself is mainly needed to activate a newly updated firmware. It will close all current connections to the administration console and to the Remote Console. The whole process will take about one minute. Resetting sub devices (e.g. video engine) will take some seconds only and does not result in closing connections. Only administrator users are allowed to do reset.





### 1. Driver and Software Support

As KVM-over-IP Sever Management is OS independent, normally you don't need load any driver at all. But in some cases, if you want to use some inband utility or application, generic IPMI driver is needed.

### **Open IPMI driver on Linux**

KVM-over-IP Sever Management can use the Open IPMI driver in Linux Kernel.

"modprobe ipmi\_devintf"

"modprobe ipmi\_si"

If you use old version Linux Kernel, module "ipmi\_si" is repaced by "ipmi\_kcs"

To load driver correctly, motherboard DMI table IPMI entry should be right. The correct value is base address 0xCA2, I/O mapping and byte spacing.

### Windows IPMI Driver

KVM-over-IP Sever Management also support Intel reference driver, you can get it on <u>http://www.intel.com/design/servers/ipmi/tools.htm</u>.

From Windows Server 2003 R2, Microsoft also provide in box IPMI driver. You can use it also.

### IPMITool and other IPMI software Support

KVM-over-IP Sever Management support open source software IPMI Tool, you can also use other one like Open IPMI, IPMI Util.

### 2. KVM-over-IP Sever Management Web Pages

No connection can be established to KVM-over-IP Sever Management. Have a look on your hardware. Is KVM-over-IP Sever Management attached to a power supply? Verify your network configuration (IP address, router). You may send a "ping" request to KVM-over-IP Sever Management to find out whether KVM-over-IP Sever Management is reachable via network.

# KVM-over-IP Sever Management web pages are not displayed correctly.

Check your browser's cache settings. Make sure the cache settings are not set to something like "never check for newer pages". Otherwise KVM-over-IP Sever Management pages may be loaded from your browser cache and not from the card.

### Login to KVM-over-IP Sever Management fails.

Verify both your user login and your password. By default, the user "super" has the password "pass".

Moreover, your web browser has to be configured to accept cookies.

### Cannot upload the signed certificate in Mac OS X.

If an "internal error" occurs while uploading the signed certificate either change the extension of the file to .txt or add a file helper using the Internet Explorer preferences for this type of file. Make sure that the encoding is set to "plain text" and the checkbox "use for outgoing" is set. As an alternative, you may also use a Mozilla based browser (Mozilla, FireFox).

## 3. Remote Video Console

# The Remote Console window of KVM-over-IP Sever Management does not open.

A firewall may prevent the access to the Remote Console. The TCP ports #80 (for HTTP) and #443 (for both HTTPS and RFB) have to be open (the server providing the firewall has to accept incoming TCP connections on these ports).

### Remote console is unable to connect and displays a timeout error.

Have a look on your hardware. If there is a proxy server between KVM-over-IP Sever Management and your host, then you may not be able to transfer the video data using RFB. Establish a direct connection between KVM-over-IP Sever Management and the client. Furthermore, check the settings of KVM-over-IP Sever Management and choose a different server port used for RFB transfer. If you use a firewall then check the according port for accepting connections. You may restrict these connections for the IP addresses used by theKVM-over-IP Sever Management and your client.

### The Remote Console does not open with Opera in Linux.

Some versions of Opera do not grant enough permission if the signature of the applet cannot be verified. To solve the problem, add the lines grant codeBase "nn.pp.rc. Remote Console Applet" { permission java.Lang. RuntimePermission "access Class In Package. sun.\*"; to the java policy file of opera (e.g./usr/share/opera/java/opera.policy).

#### The video data on the local monitor is surrounded by a black border.

This is not a failure. The local monitor is programmed to a fixed video mode that can be selected in the video settings of KVM-over-IP Sever Management.

# The local monitor displays video data but the remote screen remains blank.

If the Remote Console is connected (look at the status line of the Remote Console) you should verify that video chip DVO interface is not switched off by the video driver of your operating system. Normally, video chip onboard has 2 interfaces. One is analog and connected to local monitor. The other is DVO and wired to KVM-over-IP Sever Management slot. Some video driver will switch off the DVO output by default.

For example, RHEL 4.5 and 5 default XGI driver will disable the DVO interface. It's to say, when screen is switch to X window, remote screen will be blank. You have to use text mode or upgrade driver. RHEL4.5 need driver R1.12.02 and RHEL5 use R1.12.03.

### 4. Mouse and Keyboard

# The mouse does not react correctly in the applet screen. The mouse is not in sync with the mouse of the host.

Navigate your mouse pointer into the upper left corner of the applet screen and move it slightly forth and back. Thus the mouse will be resynchronized. If re-synchronizing fails, disable the mouse acceleration and repeat the procedure.

#### I have a crazy mouse.

Verify your mouse settings. Disable the mouse acceleration. For instance in Windows 2000 this can be done in 'Settings -> System control -> Mouse'. Make sure that your mouse settings match your mouse model, i.e. PS/2 or wheel mouse.

# Special key combinations, e.g. ALT+F2, ALT+F3 are intercepted by the console system and not transmitted to the host.

You have to define a so-called "Button Key". This can be done in the Remote Console settings. Alternatively you can use the soft keyboard feature.

### Windows XP does not awake from standby mode.

This is possibly a Windows XP problem. Try not to move the mouse pointer while XP switches into stand by mode

### For SUN computers a USB keyboard does not work.

KVM-over-IP Sever Management emulates a USB keyboard. If you attach a USB keyboard to your host two keyboards are detected. It cannot be predicted which one of these comes first and you will be able to work with. SUN supports only one USB keyboard.

# Every time I open a dialog box with some buttons the mouse pointers are not synchronous anymore.

Disable the setting "Automatically move mouse pointer to the default button of dialog boxes" in the mouse settings of your operating system.

82 http://www.tyan.com

# 3.1 About the BIOS

The BIOS is the basic input/output system, the firmware on the motherboard that enables your hardware to interface with your software. The BIOS determines what a computer can do without accessing programs from a disk. The BIOS contains all the code required to control the keyboard, display screen, disk drives, serial communications, and a number of miscellaneous functions. This chapter describes the various BIOS settings that can be used to configure your system.

The BIOS section of this manual is subject to change without notice and is provided for reference purposes only. The settings and configurations of the BIOS are current at the time of print and are subject to change, and therefore may not match exactly what is displayed on screen.

This section describes the BIOS setup program. The setup program lets you modify basic configuration settings. The settings are then stored in a dedicated, battery-backed memory (called NVRAM) that retains the information even when the power is turned off.

### To start the BIOS setup utility:

- 1. Turn on or reboot your system.
- 2. Press <Del> during POST (<Tab> on remote console) to start the BIOS setup utility.

# 3.2 BIOS Menu Bar

The menu bar at the top of the windows lists these selections:

Main	To configure basic system setups
Advanced	To configure the advanced chipset features
PCI/PnP	To configure legacy Plug & Play or PCI settings
Boot	To configure system boot order
Security	To configure user and supervisor passwords
Chipset	To configure chipset management features
Exit	To exit setup utility

# 3.3 Setup Basics

The table below shows how to navigate in the setup program using the keyboard.

Key	Function
<f1></f1>	General help window
<esc></esc>	Exit current menu
← → arrow keys	Select a different menu
$\uparrow$ or $\downarrow$ arrow keys	Move cursor up/down
<tab> / <shift-tab></shift-tab></tab>	Cycle cursor up/down
<home> / <end></end></home>	Move cursor to top/bottom of the window
<pgup> / <pgdn></pgdn></pgup>	Move cursor to next/previous page
<->	Select the previous value/setting of the field
<+>	Select the next value/setting of the field
<f8></f8>	Load Fail Safe default configuration values of the menu
<f9></f9>	Load the Optimal default configuration values of the menu
<f10></f10>	Save and exit
<enter></enter>	Execute command or select submenu

# 3.4 Getting Help

Pressing [**F1**] will display a small help window that describes the appropriate keys to use and the possible selections for the high-lighted item. To exit the Help Window, press [**ESC**].

# 3.5 In Case of Problems

If you have trouble booting your computer after making and saving the changes with the BIOS setup program, you can restart the computer by holding the power button down until the computer shuts off (usually within 4 seconds); resetting by pressing CTRL-ALT-DEL; or clearing the CMOS.

The best advice is to only alter settings that you thoroughly understand. In particular, do not change settings in the Chipset section unless you are absolutely sure of what you are doing. The Chipset defaults have been carefully chosen either by TYAN<sup>®</sup> or your system manufacturer for best performance and reliability. Even a seemingly small change to the Chipset setup options may cause the system to become unstable or unusable.

Note



The following pages provide the details of BIOS menu. Please be noticed that the BIOS menu are continually changing due to the BIOS updating. The BIOS menu provided are the most updated when this manual is written. Please visit Tyan's website at http://www.tyan.com for the information of BIOS updating.

> 84 http://www.tyan.com

# 3.6 BIOS Main Menu

The Main BIOS Menu is the first screen that you can navigate. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. "Grayed-out" options cannot be configured, options in blue can be changed.

The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often, a text message will accompany it.

BIOS Setup Utility								
Main	Advanced	PCI/PnP	Boot	Sec	curity	Chipset	Exi	t
System	Overview				Use [		TAB1 o	or
AMIBIOS Version Build Da ID	S : VX.XX te : DD/MM/YY : 0AAAA000	/ )			[SHIF a field Use config	T-TAB] to d [+] or gure system	selec	xt o
Processo Quad-Co Speed Count	or ore AMD Opter : xxxx MHz : x	o(tm) Proces	sor XXX	х				
System   Size	Memory : xxxx MB				← → ↑ ↓ : Enter	Select Scr Select Item Go to	een Sul	b
System System	Time Date	[HH:MI [MM:DI	M:SS] D:YYYY]		Scree F1 F10 ESC	en General H Save and Exit	elp Exit	

Feature	Option	Description
Main		
System Time	HH : MM : SS	Set the system time
System Date	MM : DD : YYYY	Set the system date

# 3.7 BIOS Advanced Menu

You can select any of the items in the left frame of the screen, such as Super I/O Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown below. The sub menus are described on the following pages.

		BIOS	Setup Uti	lity			
Main	Advanced	PCI/PnP	Boot	Sec	urity	Chipset	Exit
Advance	d Settings						
					Conf	igure CPU	
WARING	Setting wrong	values in be	low secti	ons			
	may cause sy	stem to mal	function.				
<ul> <li>CPU Co</li> <li>IDE Co</li> <li>Super I</li> <li>ACPI C</li> <li>APM Co</li> <li>Event L</li> <li>Hardwa</li> <li>Remote</li> <li>USB Co</li> </ul>	onfiguration nfiguration O Configuration onfiguration og Configuration ire Health Configuration e Access Config onfiguration	n on ïguration guration			← → ↑ ↓ Enter F1 F10 ESC	Select Scre Select Item r Go to Sub General He Save and E Exit	en ) Screen Ip Exit

Feature	Option	Description		
Advanced Settings				
CPU Configuration	Menu Item	Configure CPU		
IDE Configuration	Menu Item	Configure the IDE device(s)		
Super IO Configuration	Menu Item	Configures Super IO Chipset Nat417		
ACPI Configuration	Menu Item	Section for Advanced ACPI Configuration		
APM Configuration	Menu Item	Section for APM configuration		
Event Log Configuration	Menu Item	Mark as read, Clear or View Event Log statistics		
Hardware Health Configuration	Menu Item	Configure/monitor the Hardware Health		
Remote Access Configuration	Menu Item	Configure Remote Access		
USB Configuration	Menu Item	Configure the USB support		

# 3.7.1 CPU Configuration

You can use this screen to view CPU Configuration Menu. Use the up and down arrow  $(\uparrow/\downarrow)$  keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.

	BIOS Setup Utility						
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Exit	
CPU Configuration Module Version : XX.XX AGESA Version : X.X.X.X Physical Count : X Logical Count : X					This option should remain disabled for normal operation. The driver developer may disable it for testing surgeo		
Quad Co Revision Cache L Cache L Cache L Speed: Able to c uCode F	ore AMD Opter 1: xxxx 2: xxxx 3: xxxx xxxxMHZ change Freq.: Patch Level:	on (tm) NB Clk:	XXXXX XXXX XXXX XXXX XXXX XXXX XXXX XXXX	xxxx MHz	<ul> <li>← → Select</li> <li>Screen</li> <li>↑ ↓ Select</li> </ul>	ose.	
GART E Microco Secure <sup>V</sup> PowerN ACPI SF	rror Reporting de Update Virtual Machine ow RAT Table	e Mode	[Disa [Ena [Ena [Ena [Ena	ibled] bled] bled] bled] bled]	+/- Chang Option F1 Gener Help F10 Save Exit ESC Exit	ge ral and	

Feature	Option	Description	
CPU Configuration		-	
Module Version			
AGESA Version	Bood only	Displays information about CDU	
Physical Count	Read only Read only Read only Disabled Enabled Disabled Disabled Disabled Disabled Enabled Disabled Disabled Disabled Disabled Enabled Enabled Enabled	Displays information about CPU	
Logical Count			
Revision			
Cache L1			
Cache L2			
Cache L3			
Speed	Read only	Displays information about CPU	
NB Clk			
Able to change Freq.			
uCode Patch Level			
GART Error Reporting	Disabled	This option should remain disabled for normal operation. The driver	
GART LINE Reporting	Enabled	developer may enable it for the purpose of testing.	
Microcode Undate	Enabled	Enable/Disable Microcode Undate	
	Disabled		
Secure Virtual Machine	Enabled	Enable/Disable Secure Virtual	
Mode	Disabled	Machine Mode(SVM)	
PowerNow	Disabled	Enable/Disable the generation of ACPI_PPC,_PSS, and _PCT	
	Enabled	objects.	
	Enabled	Enable or Disable the building of	
ACFISRATIODE	Disabled	ACPI SRAT Table	

# 3.7.2 IDE Configuration Sub-Menu

You can use this screen to select options for the IDE Configuration Settings. Use the up and down <Arrow> Keys to select an item. Use the <Plus> and <Minus> Keys to change the value of the selection options.

Main	Advanced	BIOS PCI/PnP	Setup Uti Boot	lity Sec	urity	Chipset	Exit
IDE Configuration			While entering setup, BIOS auto detects the presence				
Onboard IDE Serial-ATA [	E Controller Devices	[Ena [Dev	ibled] /ice 0/1/2		of ID displ deteo	E devices. T ays the statu ction of IDE	his us of auto devices.
▶ nVidia RA	ID Setup						
<ul> <li>Primary IE</li> <li>Primary IE</li> <li>SATA0 (</li> <li>SATA1 (</li> <li>SATA2 (</li> <li>SATA3 (</li> <li>SATA3 (</li> <li>SATA4 (</li> <li>SATA5 (</li> </ul>	DE Master DE Slave Dev5, Func0) Dev5, Func0) Dev5, Func1) Dev5, Func1) Dev5, Func2) Dev5, Func2)	[Not [Not [Not [Not [Not [Not	Detected Detected Detected Detected Detected Detected Detected Detected	] ] ] ] ] ]	← → Select Screen ↑ ↓ Select Item +/- Change Optio F1 General Help F10 Save and Exi ESC Exit		een tion elp Exit
Hard Disk W IDE Detect 1 ATA (PI) 80I Detection	/rite Protect Fime Out (Sec) Pin Cable	[Disa [35] [Hos	abled] st & Devic	e]			

Feature	Option	Description		
IDE Configuration				
Onboard IDE	Enabled	Enable/Disable onbeard IDE controller		
Controller	Disabled			
	Device 0/1/2			
Serial-ATA	Disabled	Configure serial ATA devices.		
Devices	Device 0	-		
	Device 0/1			
Hard Disk Write	Disabled	Enable/Disable device write protection.		
Protect	Enabled	accessed through BIOS.		
IDE Detect Time Out (Sec)	<b>0~35</b> (at 5 interval)	Select the time out value for detecting ATA/ATAPI device(s).		
	Host & Device	Select the mechanism for detecting 90Din		
Cable Detection	Host			
	Device			

89 http://www.tyan.com

## 3.7.2.1 nVidia RAID Setup

	BIOS Setup Utility						
Main	Advanced	PCI/PnP	Boot	Secur	rity Chipset Exit		
RAID Set	tup	While entering setup, BIOS auto detects the					
nVidia RAID Function			Disabled]		presence of IDE devices. This displays the status of auto detection of IDE devices.		
SATA0 SATA1 SATA2 SATA3 SATA4 SATA5	(Dev 5, Func0) (Dev 5, Func0) (Dev 5, Func1) (Dev 5, Func1) (Dev 5, Func2) (Dev 5, Func2)	) [ ) [ ) [ ) [	Disabled] Disabled] Disabled] Disabled] Disabled] Disabled]		← → Select Screen ↑ ↓ Select Item +/- Change Option F1 General Help F10 Save and Exit ESC Exit		

Feature	Option	Description			
nVidia RAID Setup					
nVidia Function	Disabled	While entering setup, you can			
	Enabled	mode for each ATA channel.			
SATA0/1/2/3/4/5	Disabled Enable/Disable				
SATAU/1/2/3/4/5	Enabled	specific SATA Drive as RAID.			

### 3.7.2.2 Primary IDE Master/Slave Sub-Menu

Main	Advanced	BIOS PCI/PnP	S Setup Util Boot	ity S	Security	Chipset	Exit
Primary IDE	E Master						
Device: Not I	Detected				←→ 5	Select Screen	
Type LBA /Large N Block (Multi PIO Mode DMA Mode S.M.A.R.T. 32 Bit Data T	∕lode Sector Transfe <sup>-</sup> ransfer	er) [ [ [	Auto] Auto] Auto] Auto] Auto] Auto] Enabled]		↑ ↓ S +/- () Tab S F1 () F10 S ESC E	elect Item Change Option Select Field General Help Save and Exit Exit	n

Feature	Option	Description
Primary IDE Master/Slave		
Туре	Auto Not Installed CD/DVD ARMD	Selects the type of device connected to the system.
LBA/Large Mode	Auto	Auto: Enabled LBA Mode if the device supports it and the device is not already formatted with LBA
	Disabled	Mode disabled. Disabled: Disabled LBA Mode.
Plack (Multi Sactor Transfor)	Auto	Disabled: The Data transfer from and to the device occurs one sector at a time.
Block (Multi-Sector Transfer)	Disabled	Auto: The Data transfer from and to the device occurs multiple sectors at a time if the device supports it.
	Auto	Select the PIO Mode. Select Auto to
PIO Mode	0~4 (at 1 interval)	enhance hard disk performance by optimizing the hard disk timing.
DMA Mode	Auto	Select DMA Mode. Auto: Auto detected.
	Auto	S.M.A.R.T (Self-Monitoring Analysis
S.M.A.R.T.	Disabled	and Reporting Technology) is a utility that monitors your disk status
	Enabled	to predict hard disk failure.
32Bit Data Transfer	Enabled	Enable 32-bit to maximize the IDE
	Disabled	hard disk data transfer rate.

### 3.7.2.3 SATA0/1/2/3/4/5 Sub-Menu

Main	Advanced	BIOS PCI/PnP	Setup Utili	ty Seci	irity	Chinset	Evit
Third IDE	Master	100111	DOOL	0000	unty	Onpoor	LAR
Device: N	ot Detected				←→	· Select Scr	een
LBA /Larg Block (Mu PIO Mode DMA Mod S.M.A.R.T 32 Bit Dat	e Mode Iti-Sector Tran e : a Transfer	sfer)	[Auto] [Auto] [Auto] [Auto] [Auto] [Enabled]	]	↑ ↓ +/- Tab F1 F10 ESC	Select Item Change O Select Fiel General He Save and I Exit	ption d elp Ξxit

Feature	Option	Description			
SATA 0/1/2/3/4/5	_				
	Auto	Auto: Enabled LBA Mode if the device supports it and the device			
	Disabled	Mode disabled. Disabled: Disabled LBA Mode.			
Plack (Multi Sastar	Auto	Disabled: The Data transfer from and to the device occurs one sector at a time.			
Block (Multi-Sector Transfer)	Disabled	Auto: The Data transfer from and to the device occurs multiple sectors at a time if the device supports it.			
DIO Mode	Auto	Select the PIO Mode. Select Auto to enhance hard disk			
FIO Mode	0~4 (at 1 interval)	performance by optimizing the hard disk timing.			
DMA Mode	Auto	Select DMA Mode. Auto: Auto detected.			
	Auto	S.M.A.R.T (Self-Monitoring			
SMART	Disabled	Analysis and Reporting			
0.10.7.17.1.	Enabled	monitors your disk status to predict hard disk failure.			
22Pit Data Transfor	Enabled	Enable 32-bit to maximize the			
SZDIL DALA MANSIEI	Disabled	IDE hard disk data transfer rate.			

# 3.7.3 Super I/O Configuration Sub-Menu

You can use this screen to select options for the Super I/O settings. Use the up and down arrow  $(\uparrow/\downarrow)$  keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.

BIOS Setup Utility						
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Exit
Configure Win627 Super I/O Chipset				Allows BIOS to enable or disable		
Serial Por Chassis Ir Watchdog	t1 Address htrusion Detect Mode		[3F8/I [Disat [Disat	RQ4] bled] bled]	Floppy Conti $\leftarrow \rightarrow$ Select $\uparrow \downarrow$ Select I +/- Chang F1 Genera F10 Save a ESC Exit	roller. Screen Item e Option al Help and Exit

Feature	Option	Description			
Configure Wine	627 Super I/O Cl	nipset			
	3F8 IRQ4				
Serial Port1	3E8 IRQ4	Allow BIOS to select Serial Port1 Base			
Address	2E8 IRQ3	Addresses.			
	Disabled				
Chassis Intrusion Detect	Disabled	Enable/Disable the function of chassis			
	Enabled	event is detected, BIOS will record the event.			
	Disabled				
	2 Minutes				
Watabdag	4 Minutes	Watchdog Timer sets 2/4/6/8/10 minutes.			
Mode	6 Minutes	reboot.			
	8 Minutes				
	10 Minutes				

# 3.7.4 ACPI Configuration Sub-Menu

Use this screen to select options for ACPI. Use the up and down arrow  $(\uparrow/\downarrow)$  keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described on this page. The screen is shown below.

		BIOS S	Setup Utili	ty		
Main	Advanced	PCI/PnP	Boot	Secur	ity Chipset Ex	cit
ACPI S	ettings				Enable ACPI	
<ul><li>Advar</li><li>Chips</li></ul>	nced ACPI Cor et ACPI Config	ifiguration juration			settings	
					← → Select Screen ↑ ↓ Select Item +/- Change Optio F1 General Help F10 Save and Exit ESC Exit	'n

# 3.7.4.1 Advanced ACPI Configuration Sub-Menu

Main	Advanced	BIOS S PCI/PnP	Setup Utilit Boot	y Security	v Chipset Exit
Advanced ACPI Configuration					
ACPI Ver ACPI API AMI OEM Headless	rsion Features IC support IB table mode	ן נפ נ	ACPI v1.0] Enabled] Enabled] Disabled]		← → Select Screen ↑ ↓ Select Item +/- Change Option F1 General Help F10 Save and Exit ESC Exit

Feature	Option	Description			
Advanced ACPI Config	uration				
	ACPI v3.0	Set this value to allow or prevent			
ACPI Version Features	ACPI v2.0	the system to be complaint with the			
	ACPI v1.0	ACPI 2.0 specification.			
	Enabled	This option allows you to define			
ACPT APIC Support	Disabled	features.			
AMI OEMB table	Enabled	Set this value to allow the ACPI BIOS to add a pointer to an OEMB table in the Root System Description Table (RSDT) table			
	Disabled	Note: OEMB table is used to pass POST data to the AMI code during ACPI O/S operations.			
Headless mode	Enabled	Enable or disable Headless			
	Disabled	operation mode through ACPI.			

# 3.7.4.2 Chipset ACPI Configuration Sub-Menu

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Exit	
Chipset A	CPI Configura	tion					
MCP55 ACPI HPET TABLE [Enabled]				← → ↑ ↓ \$ +/- F1 F10 ESC	Select Screen Select Item Change Optin General Help Save and Exit Exit	n on it	

Feature	Option	Description		
Chipset ACPI Configuratio	n			
	Enabled	Enable/Disable MCP55 ACPI		
MCF33 ACFITIFET Table	Disabled	HPET Table.		

# 3.7.5 APM Configuration

	BIOS Setup Utility						
Main	Advanced	PCI/PnP	Boot	Securi	ty C	hipset	Exit
Power Mar	nagement/APN		[Enab	oled]	Enable	e or Disa	ble APM
Power But Video Pow Green PC Hard Disk Force Thro Manual Th System Th Thermal th Resume O Resume O Resume O	ton Mode Yer Down Mode Monitor Power Power Down M Time Out (Minu title rottle Ratio ermal rottle Ratio in PME# in PCIE Wake# in RTC Alarm	State lode ute)	[On/C [Enab [Stand [Dnab [Disa [50% [Disa [Disal [Disat	off] dby] oled] oled] bled] ] bled] ] bled] bled]	← → \$ ↑ ↓ \$ +/- ( Enter ( F1 0 ESC	Select So Select Iter Change ( Go to Su General I Save and Exit	rreen m Option b Screen Help I Exit

Feature	Option	Description		
APM Configuration				
Bower Management/A BM	Enabled	Enables or Disable ADM		
Power Management/APM	Disabled	Enables of Disable APM.		
	On/Off	Go into ON/OFF or suspend		
Power Button Mode	Suspend	when power button is pressed.		
Video Power Down Mode	Enabled	Power Down Video is Off		
	Disabled			
Green PC Monitor Power	Standby			
State	Suspend	Options: standby suspend off.		
Hand Diele Deven Deven	Off	Deves Deves Hand Disk is		
Hard Disk Power Down	Enabled	Power Down, Hard Disk in		
Mode	Disabled	suspend Mode.		
	1	-		
	2	-		
	3	-		
	4	-		
	5	-		
	7	-		
Hard Disk Time Out	8	Hard Disk Time Out in		
(Minute)	9	specified Minutes		
(	10			
	10	-		
	12			
	13			
	14	-		
	15	-		
	Disabled	1		
Force Threttle	Enabled	Disable, Enable the force to		
Force mroule	Disabled	thermal throttling function.		
	87.5%			
	75%			
	62.5%	Select the Duty Cycle in		
Manual Throttle Ratio	50%			
	37.5%	Throttle mode.		
	25%	_		
	12.5%			
	Enabled	Disable/Enable Thermal to		
System Thermal	Disabled	generate a power management event.		
	87.5%			
	75%	1		
	62.5%	Select the duty cycle in		
Thermal throttle Ratio	50%	throttle when the thermal		
	37.5%	override condition occurs.		
	25%			
	12.5%			

Feature	Option	Description	
Posumo On PME#	Enabled	Disable/Enable PME to	
Resulte Off PME#	Disabled	generate a wake event.	
Boourno On BCIE Wieko	Enabled	Disable/Enable PME to	
Resulte Off PCIE Wake	Disabled	generate a wake event.	
Boourno On BTC Alorm	Enabled	Disable/Enable RTC event to	
Resume On RTC Alann	Disabled	wake after a power failure.	

# 3.7.6 Event Log Configuration Sub-Menu

You can use this screen to view the Event Log Control Menu. This logs system events (such as Clear CMOS, ECC memory errors, etc) and writes the log into NVRAM. Use the up and down arrow  $(\wedge/\vee)$  keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.

		BIOS	Setup Util	lity		
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Exit
Event L	.ogging detail	s		View all ur the Event	nread events Log.	on
View Ev Mark Al Clear E	rent Log I Events as Rei vent Log	ad		← → Sele $\uparrow \downarrow$ Selec +/- Chai Enter Go t F1 Gend F10 Save ESC Exit	ct Screen t Item nge Option o Sub Scree eral Help e and Exit	'n

Feature	Option	Description
Event Logging details		
Mieur Event Lea		Views all unread events on the
View Event Log		Event Log.
Mark All Events as Boad	OK	Marka all uproad avents on road
Mark All Events as Read	Cancel	Marks all unlead events as read.
Clear Event Log	OK	Frasos all of overts
Clear Event Log	Cancel	Liases an of events.

# 3.7.7 Hardware Health Configuration Sub-Menu

You can use this screen to view the Hardware Health Configuration Settings. Use the up and down arrow  $(\Lambda/\Psi)$  keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.

		BIOS	Setup Utilit	ty	
Main	Advanced	PCI/PnP	Boot	Security	Chipset Exit
Hardware	Health Config	Enables Hardware Health Monitoring			
Auto FA	N Control		[Enabled]		Device.
<ul> <li>FAN Cor</li> <li>Voltage</li> <li>Tempera</li> </ul>	nfiguration Configuration ature Configura	tion			<ul> <li>↓ Select Screen</li> <li>↓ Select Item</li> <li>+/- Change Option</li> <li>Tab Select Field</li> <li>F1 General Help</li> <li>F10 Save and Exit</li> <li>ESC Exit</li> </ul>

Feature	Option	Description		
Hardware Health	Configuration			
Auto FAN	Enabled			
Control	Disabled	Enable/Disable AUTOFAN control.		

## 3.7.7.1 FAN Configuration Sub-Men

		BIOS S	Setup Utili	tv	
Main	Advanced	PCI/PnP	Boot	Securit	y Chipset Exit
Fan Confi	guration				
CPU FAN( CPU FAN) CPU FAN CPU FAN FAN1	) 1 2 3		XXXXX XXXX XXXX XXXX XXXX	X RPM X RPM X RPM X RPM X RPM X RPM	← → Select Screen ↑ ↓ Select Item +/- Change Option Tab Select Field F1 General Help F10 Save and Exit ESC Exit

## 3.7.7.2 Voltage Configuration Sub-Men

BIOS Setup Utility										
Main	Advanced	PCI/PnP	Boot	Securit	y Chipset Exit					
Voltage Configuration										
Voltage Configuration CPU0 Vcore CPU1 Vcore CPU2 Vcore CPU3 Vcore CPU0 Vdimm CPU1 Vdimm CPU2 Vdimm CPU3 Vdimm HT link 1.2V Chipset 1.5V Chipset 1.4V VBAT 12V(1) 12V(2) 5V SVSB 3.3V 2.2V Evel			XXXV XXXV XXXV XXXV XXXV XXXV XXXV XXX		← → Select Screen ↑ ↓ Select Item +/- Change Option Tab Select Field F1 General Help F10 Save and Exit ESC Evit					

# 3.7.7.3 Temperature Configuration Sub-Men

BIOS Setup Utility											
Main	Advanced	PCI/PnP	Boot	Security	/ Ch	ipset	Exit				
Temperat	ure Configurat										
CPU0 Temp: CPU1 Temp: CPU2 Temp: CPU3 Temp: System Temp: Slot Temp:		xxx xxx xxx xxx xxx xxx	XXX°C/ XXX°F XXX°C/ XXX°F XXX°C/ XXX°F XXX°C/ XXX°F XXX°C/ XXX°F XXX°C/ XXX°F XXX°C/ XXX°F			Select S elect Ite Change Select Fi Seneral Save and Exit	creen m Option ield Help d Exit				
## 3.7.8 Remote Access Configuration Sub-Menu

You can use this screen to view the Remote Access Configuration Menu. This feature allows access to the Server remotely via serial port. Use the up and down arrow  $(\Lambda/\Psi)$  keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.

BIOS Setup Utility						
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Exit
Configu	Configure Remote Access type and parameters					te
					access type	
Remote /	Access		[Disabled	]		
Serial Po Base Serial Po Flow Cor Redirecti Terminal VT-UTF8 Serdir Me	rt Number Address, IRQ rt Mode htrol on After BIOS Type Combo Key S emory Display	POST upport Delay	[COM1] [3F8h,4] [115200 ; [None] [Always] [ANSI] [Enabled [NO Dela	8,n,1]   y]	← → Select ↑ ↓ Select +/- Chang F1 Gener F10 Save a ESC Exit	Screen Item je Field al Help and Exit

Feature	Option	Description			
Configure Remote Acces	s type and para	meters			
Domoto Acceso	Enabled	Enables remote access to			
Remote Access	Disabled	system through serial port.			
Serial Port Number	COM1	Select Serial Port for console redirection.			
	115200 8, n,1				
	56700 8,n,1				
Serial Port Mode	38400 8,n,1	Select Serial Port Settings			
	19200 8,n,1				
	09600 8,n,1				
	None	Salact Elow Control for consolo			
Flow Control	Hardware	redirection			
	Software	redirection.			
Redirection After BIOS	Disabled	Disabled: turns of the redirection after Boot. Redirection is active during POST and during Boot loader.			
POST	Always				
	ANSI				
Terminal Type	VT100	Select the target terminal type.			
	VT-UTF8				
VT-UTF8 Combo Key	Enabled	Enable/Disable VT-UTF8			
Support	Disable	ANSI/VT100 terminals.			
	No Delay				
Serdir Memory Display	Delay 1Sec	Gives the delay in seconds to			
Delay	Delay 2Sec	display memory information.			
	Delay 4Sec				

## 3.7.9 USB Configuration Sub-Menu

You can use this screen to view the USB Configuration Menu. Use the up and down arrow  $(\Lambda/\Psi)$  keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.

	BIOS Setup Utility						
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Exit	
USB Configuration					Enables support for legacy USB.		
Module Ve	rsion – X.XX.X	-XX.X					
USB Devic	USB Devices Enabled: None					Screen	
Legacy US USB 2.0 C BIOS EHC	B Support ontroller Mode Hand-Off	(Er (Hi (Er	nabled] Speed] nabled]		<ul> <li>↑ ↓ Select If</li> <li>+/- Change</li> <li>F1 General</li> </ul>	em Option Il Help	
<ul> <li>USB Mass Storage Device Configuration</li> </ul>				F10 Save a ESC Exit	nd Exit		

Feature	Option	Description			
USB Configuration	-	-			
	Disabled	Enables support for lease / USP			
Legacy USB Support	Enabled	Enables support for legacy USB.			
LISP 2.0 Controllor Mode	Hi Speed	Configure the USB 2.0 controller in Hi Speed (480Mbps) or Full Speed			
	Full Speed	set USB2.0 Controller Mode as "Full Speed".			
PIOS EHCI Hand Off	Enabled	This is a work around for OSes without EHCI hand-off support. The			
	Disabled	EHCI ownership change should claim by EHCI driver.			

## 3.7.9.1 USB Mass Storage Device Configuration Sub-Men

Main	A du como o o d	BIOS S	Setup Utili	ty Coorrig	hu Ohinaat Evit
Main	Advanced	PCI/PhP	BOOT	Securi	ty Chipset Exit
USB Mas	s Storage Devi	← → Select Screen ↑ ↓ Select Item			
USB Mass Delay Dev Emu	s Storage Rese ice # 1 ılation Type	t [20 XX [Au	) Sec] XX uto]		+/- Change Option Tab Select Field F1 General Help F10 Save and Exit ESC Exit

Feature Option		Description			
USB Mass Storage Device Configuration					
	20 Sec	Number of ecoends DOST			
USB Mass Storage Reset Delay	10 Sec	waits for the USB mass			
	30 Sec	storage device after start unit			
	40 Sec	command.			
	Auto	If Auto, USB devices less than			
	Floppy	530MB will be emulated as Floppy and remaining as hard			
Emulation Type	Forced FDD	drive. Forced FDD option can			
	Hard Disk	be used to force a HDD formatted drive to boot as			
	CDROM	FDD.			

# 3.8 PCI PnP Menu

You can use this screen to view PnP (Plug & Play) BIOS Configuration Menu. This menu allows the user to configure how the BIOS assigns resources & resolves conflicts. Use the up and down arrow  $(\uparrow/\downarrow)$  keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.

BIOS Setup Utility						
Main	Advanced	PCI/PnP	Boot	Securi	ity Chipset Exit	
Advanced PCI/PnP Settings				Clear NVRAM during System Boot.		
WARING: may cause syst Clear NVR Plug & Pla PCI Latend Allocate IR Palette Sn PCI IDE B	Setting wrong eem to malfund AM y O/S cy Timer Q to PCI VGA ooping usMaster	values in be	[No] [No] [64] [Yes] [Disabled] [Enabled]	ns ]	← → Select Screen ↑ ↓ Select Item +/- Change Option F1 General Help F10 Save and Exit ESC Exit	

Feature	Option	Description		
Advanced PCI/PnP Se	ettings			
	No	Clears NVRAM during system		
	Yes	Boot.		
Plug & Play OS	Yes	No: lets the BIOS configure all the devices in the system. Yes: lets the operating system configure Plug and Play (PpP)		
	No	devices not required for boot if your system has a Plug and Play operating system.		
	32	This setting controls how many		
	64	PCI clocks each PCI device can		
	96	hold the bus before another PCI		
DOLL stars Times	128	higher values, every PCI device		
PCI Latency Timer	160	can conduct transactions for a		
	192	longer time and thus improve the		
	224	Values in units of PCI clocks for		
	248	PCI device latency timer register.		
Allocato IBO to BCLVCA	Yes	Yes: assigns IRQ to PCI VGA		
Allocate IRQ to PCI VGA	No	card if card requests IRQ.		
Delette Caserier	Disabled	This is the default setting and should not be changed unless the VGA card manufacturer requires Palette Snooping to be Enabled.		
Palette Shooping	Enabled	Enabled: informs the PCI devices that an ISA graphics device is installed in the system so the card will function correctly.		
	Disabled	Enabled: BIOS uses PCI bus		
PCI IDE BusMaster	Enabled	mastering for reading / writing to		
	Reserved	IDE drives.		

## 3.9 Boot Menu

You can display Boot Setup option by highlighting it using the Arrow  $(\Lambda/\Psi)$  keys and pressing Enter. The settings are described on the following pages.

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Sec	urity	Chipset	Exit
Boot Settings				Conf durin	igures settin Ig System B	gs oot.	
<ul> <li>Boot Settings Configuration</li> </ul>				← → Select Screen			
<ul> <li>Boot D</li> </ul>	evice Priority				Enter Go to Sub Screen		
<ul> <li>Boot Device Priority</li> <li>Hard Disk Drives</li> <li>Removable Drives</li> <li>Network Drives</li> </ul>					F1 F10 ESC	General He Save and E Exit	elp Exit

## 3.9.1 Boot Settings Configuration Sub-Menu

Use this screen to select options for the Boot Settings Configuration. Use the up and down arrow  $(\Lambda/\Psi)$  keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.

	BIOS Setup Utility						
Main	Advanced	PCI/PnP	Boot	Secur	ity Chipset Exit		
Boot Set	Boot Settings Configuration				Allows BIOS to skip		
Quick Boo Quiet Boo Add On F Boot up N	ot ot ROM Display M Jum-Lock	ode	[Disabled] [Disabled] [Force BIOS [On]	5]	booting. This will decrease the time needed to boot the system.		
PS/2 Mou Keyboard Wait for 'f Hit 'DEL' PXE featu Interrupt	ise Support   Error Report <sup>=</sup> 1' if Error Message Disp ure 19 Capture	ay	[Auto] [Disable] [Enabled] [Disabled] [Disabled] [Enabled]		← → Select Screen ↑ ↓ Select Item +/- Change Option F1 General Help		
POST Sta	atus Output to	LCD	[Enabled]		ESC Exit		
Endless E	Boot		[Disabled]				

Feature	Option	Description			
Boot Settings Configu	ration				
Quick Poot	Enabled	This option allows user bypass			
	Disabled	BIOS self test during POST.			
Quiet Boot	Disabled	Disabled: displays normal POST messages.			
	Enabled	Enabled: displays OEM log instead of POST messages.			
Add On ROM Display	Force BIOS	Allows user to force BIOS/Option			
Mode	Keep Current	displayed during quiet boot.			
Boot up Num-Lock	On Off	Selects Power-on state for Numlock.			
	Enabled				
PS/2 Mouse Support	Disabled	Selects support for PS/2 Mouse.			
	Auto				
Keyboard Error	Enabled	Keyboard error report on event log			
Report	Disabled	hoyboard only report on overling			
Wait for 'E1' If Error	Enabled	Waits for F1 key to be present if			
	Disabled	error occurs.			
Hit 'DEL' Message	Enabled	Displays "Press DEL to run Setup"			
Display	Disabled	in POST.			
PXE feature	Enabled Disabled	Enable/Disable PXE Oprm Scan			
Internat 10 Conture	Disabled	Enabled: allows option ROMs to			
Interrupt 19 Capture	Enabled	trap interrupt 19.			
POST Status Putput to LCD	Enabled	POST Status Output to TYAN <sup>®</sup> LCD module through UART PORT I/O=2F8h DON'T IO PORT BE CONFLICTED			
	Disabled	WITH CONSOLE REDIRECT			
Endless Boot	Enabled	Enable/Disable endless loop boot			
	Disabled	from BBS table.			

## 3.9.2 Boot Device Priority

Use this screen to select options for the Boot Device Priority. Use the up and down arrow  $(\uparrow/\lor)$  keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.

BIOS Setup Utility							
Main	Advanced	PCI/PnP	Boot	Secu	rity	Chipset	Exit
Boot De	vice Priority				Specifies the boot		
1st Boot	Device	[x	x,xxx-xxxx	x:xxx]	available devices.		
2nd Boo	t Device	[xx,xxx-xxxxx:xxx]			A device enclosed in parenthesis has been disabled in the corresponding type menu.		sed in s been type
					←	<ul> <li>Select Sc</li> <li>Select Iter</li> <li>Change C</li> <li>General F</li> <li>Save and</li> <li>Exit</li> </ul>	reen n Option Ielp Exit

Feature	Option	Description		
Boot Device Priori	ty			
1st Boot Device	XX,XXX-XXXXX:XXX	Settings for boot priority.		
2nd Boot Device	Disabled	customized depending on your preference.		

## 3.9.3 Hard Disk Drives

	BIOS Setup Utility						
Main	Advanced	PCI/PnP	Boot	Secur	ity	Chipset	Exit
Hard Disk Drives					Specifies the boot		
1st Driv	е	[xx,xxx-xxxxx:xxx]			avail	able device	es.
					< → ↑ ↓ +/- F1 F10 ESC	Select Sci Select Iten Change C General H Save and Exit	reen n )ption Ielp Exit

Feature	Option	Description		
Hard Disk Drives				
1st Drive	xx,xxx-xxxxx:xxx	Specifies the boot sequence from the		
	Disabled	available devices.		

## 3.9.4 Removable Drives

BIOS Setup Utility								
Main	Advanced	PCI/PnP	Boot	Se	ecurity	Chipset	Exit	
Removable Drives					Specifies the boot			
1st Driv	/e	[X]	(,XXX- -		available devices.			
		XX	xxx:xxx]		$\leftarrow \rightarrow \xi$	Select Screer	ו	
					↑↓ S	elect Item		
					+/- (	Change Optic	on	
					F1 (	General Help		
					F10 8	Save and Exi	t	
					130 1			

Feature	Option	Description		
Network Drives	i			
1st Drive	XX,XXX-XXXXX:XXX	Specifies the boot		
	Disabled	sequence from the available devices.		

## 3.9.5 Netwod Drives

		BIOS	Setup Util	ity			
Main	Advanced	PCI/PnP	Boot	Secur	ity	Chipset	Exit
Networ	d Drives				Spec	cifies the bo	oot the
1st Driv	e	[XX	(,xxx-xxxx	(x:xxx]	avail	able device	es.
2nd Driv	ve	[X)	(,xxx-xxxx	(x:xxx]			
					<ul> <li>← →</li> <li>↑ ↓</li> <li>+/-</li> <li>F1</li> <li>F10</li> <li>ESC</li> </ul>	Select Sca Select Iten Change C General H Save and Exit	reen n )ption lelp Exit

Feature	Option	Description
Network Drives		
1st Drive 2nd Drive	XX,XXX-XXXXX:XXX	Specifies the boot
	Disabled	available devices.

# 3.10 Security Menu

The system can be configured so that all users must enter a password every time the system boots or when BIOS Setup is entered, using either the Supervisor password or User password. The Supervisor and User passwords activate two different levels of password security. If you select password support, you are prompted for a one to six character password. Type the password on the keyboard. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must clear CMOS and reconfigure.

		ility				
Main	Advanced	PCI/PnP	Boot	Security	<ul> <li>Chipset</li> </ul>	Exit
Security	Settings	Install or cha password.	nge the			
Superviso User Pas	or Password : sword		$\leftarrow \rightarrow$ Select Screen			
Change Supervisor Password Change User Password					+/- Change F1 Genera	e Option al Help
Boot Sector Virus Protection			[Disab	led]	F10 Save a ESC Exit	nd Exit

Feature	Option	Description			
Security Settings		·			
	Not Installed	If the password has been set,			
Supervisor Password:	Installed	password is set, Not Installed displays.			
	Not Installed	If the password has been set,			
User Password:	Installed	password is set, Not Installed displays.			
Change Supervisor Password		Selects this option to change or install Supervisor Password.			
Change User Password		Selects this option to change or install User Password.			
Boot Sector Virus	Disabled	When it is set to [Enabled], BIOS will issue a virus warning			
Protection	Enabled	the boot sector or the partition table of the HDD is attempted.			

# 3.11 Chipset Menu

This menu allows the user to customize functions of the AMD Chipsets. North Bridge configuration contains options for Memory & CPU settings. South Bridge configuration contains options for SM Bus & USB. Additional configuration for the AMD8131 PCI-X Tunnel is available in the PCI-X Configuration Menu. Select a menu by highlighting it using the Arrow  $(\Lambda/\Psi)$  keys and pressing Enter. The settings are described on the following pages.

		ility					
Main	Advanced	PCI/PnP	Boot	Se	ecurity	Chipset	Exit
Advanced Chipset Settings					Option	is for NB	
WARNING: Setting wrong values in below sections may cause system to malfunction.					← → Select Screen ↑ ↓ Select Item		
<ul> <li>Northbridge Configuration</li> <li>Southbridge/MCP55 Configuration</li> <li>Hyper Transport Configuration</li> </ul>					Enter ( F1 ( F10 S ESC E	Go to Sub Scr General Help Save and Exit Exit	reen

## 3.11.1 Northbridge Configuration Sub-Menu

This menu gives options for customizing memory & Hypertransport settings. Select a menu by highlighting it using the Arrow ( $\wedge/\vee$ ) keys and pressing Enter. The settings are described on the following pages.

	BIOS Setup Utility						
Main	Advanced	PCI/PnP	Boot	Securi	ty	Chipset	Exit
NorthBri	dge Chipset	Configurat	ion				
<ul> <li>Memor</li> <li>ECC C</li> <li>DRAM</li> <li>IOMMU</li> </ul>	y Configuratio onfiguration Timing Config J Option Menu	n juration i					
Alternate Memory T	VID Timing Parame	eters	[Auto] [CPU No	ode 0]			
Memory CLK CAS latency (Tcl) RAS/CAS Delay (Trcd) Row Precharge Time (Trp) Min Active RAS (Tras) RAS/RAS Delay (Trrd) Row Cycle (Trc)		:XXX MH :XX :X CLK :X CLK :X CLK :X CLK :XX CLK	Ηz	← → Ente F1 F10 ESC	<ul> <li>Select So</li> <li>Select Iter</li> <li>Go to Su</li> <li>General I</li> <li>Save and</li> <li>Exit</li> </ul>	rreen n b Screen Help I Exit	

Feature	Option	Description				
NorthBridge Chipset	Configuration					
	Auto					
	0.850V	*				
	1.050V					
	1.025V					
	1.000V					
	0.975V	Specify the alternate VID while in				
Alternate VID	0.950V	low power status.				
	0.925V					
	0.900V	*				
	0.875V	*				
	0.825V	-				
	0.800V					
Memory Timing	CPU Node 0	Select which node's timing				
Parameters		parameters to display .				
Memory CLK	Read only	It shows the clock frequency of the installed SDRAM.				
CAS Latency (Tcl)	Read only	This controls the timing delay (in clock cycles) before SDRAM starts a read command after receiving it.				

Feature	Option	Description		
NorthBridge Chipset	Configuration			
RAS/CAS Delay (Trcd)	Read only	When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from RAS (row address strobe) to CAS (column address strobe). The less the clock cycles, the faster the DRAM performance.		
Min Active RAS (Tras)	Read only	This setting allows you to select the number of clock cycles allotted for the RAS pulse width, according to DRAM specifications. The less the clock cycles, the faster the DRAM performance.		
Row Precharge Time (Trp)	Read only	This item controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If insufficient time is allowed for the RAS to accumulate its chage before DRAM refresh, refresh may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system.		
RAS/RAS Delay (Trrd)	Read only	Auto uses hardware compensation values. Other values add to or subtract from hardware generated value. Recommended setting is Auto.		
Row Cycle (Trc)	Read only	Bits 7-4. RAS#-active to RAS#- active or auto refresh of the same bank.		

## 3.11.1.1 Memory Configuration Sub-Menu

This menu has options for memory speed & latency. Use the up and down arrow  $(\uparrow/\downarrow)$  keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.

		BIOS	Setup U	tility		
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Exit
Memory	Configuratior	ı			Enable bank interleaving	memory
Bank Inte Channel i	erleaving nterleaving	<b>[A</b> [X0	uto] OR of Add	dress bit]		
Enable Cl MemClk T Memory H CS Spurir DCT Ung Power do Power	ock to All DIM Fristate C3/AT Hole Remapping Enable Janged mode wn enable down mode	Ms [Di LVID [Di Ing [Di [Al [Ei [Ci	isabled] isabled] isabled] isabled] ways] nabled] hannel]		$\leftarrow \rightarrow$ Select : $\uparrow \downarrow$ Select II +/- Change F1 Genera F10 Save a ESC Exit	Screen tem e Option Il Help nd Exit

Feature	Option	Description		
Memory Configuration				
	Disabled			
	Address bits 6			
	Reserved			
	Address bits 12			
Channel interleaving	Reserved	Enabled Channel Memory		
Channel meneaving	XOR of Address	Interleaving		
	bits [20:16,6]	_		
	Reserved			
	XOR of Address			
	bits [20:16,9]			
Enable Clock to All	Disabled	Enable unused clocks to DIMMs even memory slots are		
DIMMs	Enabled	not populated.		
MemClk Tristate	Disabled	Enable/Disable MemClk Tri-		
C3/ATLVID	Enabled	Stating during C3 and Alt VID		
Momony Hole Romanning	Disabled	Enable Memory Remapping		
Memory hole Remapping	Enabled	around Memory Hole		
CS Sparing Enable	Disabled	Reserve a spare memory rank		
CS Sparing Enable	Enabled	in each mode.		
	Auto	This allows selection of unganged Dram mode		
DCT Unganged Mode		(64-bit width).		
0 0	Always	Auto=Ganged mode		
	-	Always=Unganged mode		
Bower Down Enable	Enabled	Enable or disable DDR power		
Fower Down Enable	Disabled	down mode.		
Rower Down Mede	Channel	Select the newer down made		
Fower Down Mode	Chip Select	Select the power down mode.		

## 3.11.1.2 ECC Configuration Sub-Menu

This menu allows the user to configure ECC setup for system & DRAM. Use the up and down arrow  $(\uparrow/\downarrow)$  keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.

	BIOS Setup Utility						
Main	Advanced	PCI/PnP	Boot	Securi	ty C	hipset	Exit
ECC Con	figuration				Set the protec super	e level of tion. Note ECCmoo	ECC e:The le
ECC MO	DE		[Basic	]	dynam	nically se	ts the
DRAM EC	CC Enable		[Disabl	led]	Dram	scrub rat	e so all
DRAM SO	CRUB REDIRI	ECT	[Enable	ed]	of mer	nory is se	crubbed
4-Bit ECC	Mode		[Disab	led]	in 8 ho	ours.	
DRAM BO	G Scrub		[Enable	ed]			
Data Cac	he BG Scrub		[Disabl	led]	$\leftarrow \rightarrow \xi$	Select Sc	reen
L2 Cache	BG Scrub		[Disab	led]	↑↓ S	Select iter	n
L3 Cache	BG Scrub		[Disab	led]	+/- (	Change (	Option
					F1 (	General I	Help
					F10 \$	Save and	Exit
					ESC I	Exit	

Feature	Option	Description			
ECC Configuration	n				
DRAM ECC	Disabled	DRAM ECC allows hardware to report and correct memory errors automatically			
Enable	Enabled	maintaining system integrity.			
	Disabled	Enable 4-Bit ECC Mode.			
4-BILECC MODE	Enabled	Note: Also known as CHIPKILL ECC Mode			
DRAM SCRUB	Disabled	DRAM SCRUB REDIRECT allows the system to correct DRAM ECC errors			
REDIRECT	Enabled	immediately when they occur, even if background scrubbing is on.			
	Enabled				
	40ns				
	80ns				
	160ns				
	320ns				
	640ns	DRAM scrubbing corrects memory errors so			
	1.28us	later reads are correct. Doing this while			
DRAM BC Scrub	2.56us	memory is not being used improves			
DRAW DG Scrub	5.12us	performance.			
	10.2us	Note: When AMD's node interleave feature is			
	20.5us	enabled, BIOS will force DRAM scrub off.			
	41.0us				
	81.9us				
	163.8us				
	327.7us				
	655.4us				

Feature	Option	Description				
ECC Configuration	n .					
	Disabled					
	40ns					
	80ns					
	160ns					
	320ns					
	640ns					
	1.28us	Allows the L2 Data Cache RAM to be				
L2 Cache BG	2.56us	corrected while idle.				
Scrub	5.12us					
	10.2us					
	20.5us					
	41.0us					
	81.9us					
	163.8us					
	327.7us					
	655.4us					
	Disabled					
	40ns					
	80ns					
	160ns					
	320ns					
	640ns					
L3 Cache BG	1.28us	Allows the LO Date Cashe DAM to be				
	2.56us	Allows the Lo Data Gathe RAIM [0				
Scrub	5.12us	corrected while idle.				
	10.2us					
	20.5us					
	41.0us					
	81.9us					
	163.8us					
	327.7us					
	655.4us					
	40ns					
	80ns					
	160ns					
	320ns					
	640ns					
	1.28us					
	2.56us					
Data Cache BG	5.12us	Allows the L1 Data Cache RAM to be				
Scrub	10.2us	corrected while idle.				
	20.5us					
	41.0us					
	81.9us					
	163.8us					
	327.7us					
	655.4us					
	655.4us					

#### 3.11.1.3 DRAM Timing Configuration Menu

This menu allows the user to configure Dram Timing configuration for memory clock and timing mode. Use the up and down arrow  $(\Lambda/\Psi)$  keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.

		BIOS	Setup Uti	lity		
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Exit
DRAM	Timing Confi	guration			Auto Limit	
Memory DRAM	Clock Mode		[Auto]		Manual	
DIVAN			[Auto]			
					$\leftarrow \rightarrow \text{Select}$	Screen
					↑ ↓ Select i	tem
					+/-	Change
					Option	
					F1 Genera	al Help
					F10 Save a	nd Exit
					ESC Exit	

Feature	Option	Description			
DRAM Timing	Configration				
Momony	Auto	Auto			
Clock Modo	Limit	Limit			
CIOCK MODE	Manual	Manual			
	200	Select the DRAM Frequency programming			
Memclock	266	method. If Auto, the DRAM speed will be			
	333	based on SPDS. If Limited, the DRAM Spe			
value	400	the DRAM specified will be programmed			
	533	regardless.			
	Auto	A			
DRAM Timing Mode	DCT0	Auto			
	DCT1	Limit			
	Both	manual			

## 3.11.1.4 IOMMU Option Menu

This menu has options for IOMMU. Use the up and down arrow  $(\Lambda/ \!\!\!/ \, \!\!\!/)$  keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.

	BIOS Setup Utility						
Main	Advanced	PCI/PnP	Boot	Secur	ity	Chipset	Exit
IOMMU	Лоde	[.	AGP Pres	sent]	Set syst or di Som valic oper ensu oper	GART size ems withou isable altog he OSes red d GART for ration, If AC sent, select ropriate opti ure proper A ration.	in t AGP, ether. quire proper GP is ion to AGP
					←	<ul> <li>Select Sc</li> <li>Select Iten</li> <li>Change C</li> <li>General F</li> <li>Save and</li> <li>Exit</li> </ul>	reen n )ption Ielp Exit

Feature	Option	Description		
IOMMU Configuration				
	AGP Present			
	Disabled	Set GART size in systems without		
	32 MB	AGP, or disable altogether. Some		
	64 MB	DSes require valid GART IOI		
	128 MB	proper operation, if AGP is		
	256 MB	to ensure proper AGP operation		
	512 MB			
	1 GB			

## 3.11.2 Southbridge Configuration Sub-Menu

This menu gives options for southbridge devices settings. Select a menu by highlighting it using the Arrow  $(\uparrow/\downarrow)$  keys and pressing Enter. The settings are described on the following pages.

		BIOS	Setup Ut	ility		
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Exit
SouthBridg	SouthBridge Chipset Configuration					ad
CPU/LDT S PCIE Sprea SATA Sprea Primary Gra USB1.1 Cor USB2.0 Cor	pread Spectru d Spectrum ad Spectrum phics Adapter htroller htroller	m [C [D [E [E [E [E	Center Spi Disabled] Inabled] PCI Expre Enabled] Enabled]	read] ess ->PCI]		
Restore on A On-board L/ SAS Function SAS Option	AC Power Los AN on ROM	s (L [E [E	ast State Enabled] Enabled] Enabled]	9]	$\leftarrow \rightarrow$ Select $\uparrow \downarrow$ Select Enter Go to Screen F1 Gener F10 Save a ESC Exit	Screen Item Sub al Help and Exit

Feature	Option	Description	
SouthBridge Chipset Cor	figuration		
	Disabled	Disabled Up Spread Center Spread.	
CPU/LDT Spread	Up Spread	Select CPU/LDT Spread Spectrum	
Spectrum	Center Spread	Mode.	
BCIE Sprood Spootrum	Disabled	Select PCIE Spread Spectrum	
PCIE Spread Spectrum	Enabled	Mode.	
SATA Sproad Sportrum	Disabled	Select SATA Spread Spectrum	
SATA Spread Spectrum	Enabled	Mode.	
Primary Graphics	PCI Express ->PCI	Set Primary Graphics Adapter	
Adapter	PCI -> PCI Express	Mode.	
	Enabled	Enable/Disable LISB 1 1 Controller	
038 1.1	Disabled		
	Enabled	Enable/Disable LISP 2.0 Controller	
036 2.0	Disabled		
On-board lan	Enabled	Enable/Disable the on-boar LAN	
	Disabled	(Inter 82571)	
Postoro on AC Power	Power Off	System State after Postere on AC	
Loss	Power On	Power Loss	
2033	Last State	1 OWEI LOSS	
SAS Eurotion	Enabled	Enable/disable SAS Eurotion	
SAS FUNCTION	Disabled	Enable/disable SAS Function.	
SAS Option BOM	Enabled	Enable/disable SAS Ontion	
	Disabled	Enable/disable SAS Option.	

## 3.11.3 Hyper Transport MCP55 Configuration Sub-Menu

This menu gives Hyper Transport Links settings. Select a menu by highlighting it using the Arrow  $(\uparrow/\downarrow)$  keys and pressing Enter. The settings are described on the following pages.

BIOS Setup Utility						
Main	Advanced	PCI/PnP	Boot	Security	Chipset E:	xit
Hper Transport MCP55 Configuration			MCP55(SB) to K8 frequency selectic CPU capability	3(CPU) on by		
Mcp55(SB) Mcp55(SB) Mcp55(SB) IO55(BR) tr IO55(BR) tr IO55(BR) tr	to K8 (CPU) to K8 (CPU) to K8 (CPU) o K8(CPU) Fra o K8(CPU) Fra o K8(CPU) Lir	Freq Auto Frequency LinkWidth eq Auto equency kWidth	[Disa [1000 [16↓ [Disa [1000 [16↓	bled] ) MHz] ,16 ↑ ] bled] ) mhz] ,16 ↑ ]	← → Select Scree $\uparrow \downarrow$ Select Item Enter Go to Sub S F1 General Hel F10 Save and Ex ESC Exit	en Screen Ip xit

Feature	Option	Description		
Hyper Transport MCP	55 Configuration			
Mcp55(SB) to K8	Enabled	MCP55 (SB) to K8 (CPU) Frequency		
(CPU) Freq Auto	Disabled	Selection by CPU capability.		
	200			
	400			
	600			
Mcp55(SB) to K8	800	MCP55 (SB) to K8 (CPU) Frequency		
(CPU) Frequency	1000	Selection.		
	1200			
	1400			
	1600			
Mon55(SR) to K8	4 ↓ 4 ↑	MCR55 (SR) to K8 (CRU) link width		
(CPLI) LinkWidth	8↓8↑	selection		
	16 ↓ 16 ↑			
IO55(BR) to K8(CPU)	Enabled	IO55(BR) to K8(CPU)frequency		
Freq Auto	disabled	selection by CPU capability		
	200			
	400			
	600			
IO55(BR) to K8(CPU)	800	IO55(BR) to K8(CPU)frequency selection		
Frequency	1000			
	1200			
	1400			
	1600			
IO55(BR) to	4↓4↑	IO55(PP) to K8(CPLI) Link width		
K8(CPU)linkwidth	8↓8↑	selection		
	16 ↓ 16 ↑			

## 3.12 Exit Menu

You can display an Exit BIOS Setup option by highlighting it Arrow  $(\Lambda/\Psi)$  keys and pressing Enter.

BIOS Setup Utility						
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Exit
Exit Opt	ions			Exit syste saving th	em setup aft e changes.	er
Save Changes and Exit Discard Changes and Exit Discard Charges Load Optimal Defaults Load Failsafe Defaults			F10 key of operation ← → Sele ↑ ↓ Sele Enter Go F1 Gel F10 Sav ESC Exi	can be used to be used ect Screen to Sub Screen neral Help ve and Exit t	for this	

#### Save Changes and Exit

Use this option to exit setup utility and re-boot. All new selections you have made are stored into CMOS. System will use the new settings to boot up.

#### **Discard Changes and Exit**

Use this option to exit setup utility and re-boot. All new selections you have made are not stored into CMOS. System will use the old settings to boot up.

#### **Discard Changes**

Use this option to restore all new setup values that you have made but not saved into CMOS.

#### Load Optimal Defaults

Use this option to load default performance setup values. Use this option when system CMOS values have been corrupted or modified incorrectly.

#### Load Failsafe Defaults

Use this option to load all default failsafe setup values. Use this option when troubleshooting.

**NOTE**: if you experience problems with setting up your system, always check the following things in the following order:

### Memory, Video, CPU

By checking these items, you will most likely find out what the problem might have been when setting up your system. For more information on troubleshooting, check the TYAN<sup>®</sup> website at: <u>http://www.tyan.com</u>.

# 4.1 Beep Codes

Fatal errors, which halt the boot process, are communicated through two kinds of audible beeps.

•A single long beep followed by two short beeps: It indicates that a video error has occurred.

•A single long beep repeatedly: It indicates that a DRAM error has occurred.

The most common type of error is a memory error.

Before contacting your vendor or TYAN<sup>®</sup> Technical Support, be sure that you note as much as you can about the beep code length and order that you experience. Also, be ready with information regarding add-in cards, drives and O/S to speed the support process and come to a quicker solution.

# 4.2 Flash Utility

Every BIOS file is unique for the motherboard it was designed for. For Flash Utilities, BIOS downloads, and information on how to properly use the Flash Utility with your motherboard, please check the TYAN<sup>®</sup> web site: <u>http://www.tyan.com/</u>

Note

Please be aware that by flashing your BIOS, you agree that in the event of a BIOS flash failure, you must contact your dealer for a replacement BIOS. There are no exceptions. TYAN<sup>®</sup> does not have a policy for replacing BIOS chips directly with end users. In no event will TYAN<sup>®</sup> be held responsible for damages done by the end user.

# 4.3 AMIBIOS Post Code

The POST code checkpoints are the largest set of checkpoints during the BIOS pre-boot process. The following table describes the type of checkpoints that may occur during the POST portion of the BIOS:

Checkpoint	Description
	Disable NMI, Parity, video for EGA, and DMA controllers. Initialize
03	BIOS, POST, Runtime data area. Also initialize BIOS modules on
	POST entry and GPNV area. Initialized CMOS as mentioned in the
	Kernel Variable "wCMOSFlags."
	Check CMOS diagnostic byte to determine if battery power is OK and
	CMOS checksum is OK. Verify CMOS checksum manually by
0.4	reading storage area. If the CMOS checksum is bad, update CMOS
04	with power-on default values and clear passwords. Initialize status
	register A.
	Initializes data variables that are based on CMOS setup questions.
	Initializes both the active compatible PICs in the system
05	interrupt vector table
	Do RAW test to CH 2 count rog Initialize CH 0 so system timer Install
	the POSTINITICh handler. Enable IPO 0 in PIC for system timer.
06	interrupt
	Trans INT1Ch vector to "POSTINT1ChHandlerBlock "
	Initializes the CPU. The BAT test is being done on KBC. Program
08	the keyboard controller command byte is being done after Auto
00	detection of KB/MS using AMI KB-5
0A	Initializes the 8042 compatible Key Board Controller
0R	Detects the presence of PS/2 mouse
00	Detects the presence of Keyboard in KBC port
	Testing and initialization of different Input Devices. Also, undate the
	Kernel Variables
0F	Traps the INT09h vector so that the POST INT09h handler gets
	control for IRQ1. Uncompress all available language. BIOS logo, and
	Silent logo modules.
13	Early POST initialization of chipset registers.
24	Uncompress and initialize any platform specific BIOS modules.
30	Initialize System Management Interrupt
	Initializes different devices through DIM.
2A	See <i>DIM Code Checkpoints</i> section of document for more information.
20	Initializes different devices. Detects and initializes the video adapter
20	installed in the system that have optional ROMs.
2E	Initializes all the output devices.
31	Allocate memory for ADM module and uncompress it. Give control to
	ADM module for initialization. Initialize language and font modules for
	ADM. Activate ADM module.
22	Initializes the silent boot module. Set the window for displaying text
33	information.
37	Displaying sign-on message, CPU information, setup key message,
31	and any OEM specific information.

Checkpoint	Description
20	Initializes different devices through DIM. See DIM Code Checkpoints
30	section of document for more information.
39	Initializes DMAC-1 & DMAC-2.
3A	Initialize RTC date/time.
30	Test for total memory installed in the system. Also, Check for DEL or
50	ESC keys to limit memory test. Display total memory in the system.
3C	Mid POST initialization of chipset registers.
40	Detect different devices (Parallel ports, serial ports, and coprocessor in CPU, etc.) successfully installed in the system and update the BDA, EBDAetc.
50	Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size if needed.
52	Updates CMOS memory size from memory found in memory test. Allocates memory for Extended BIOS Data Area from base memory.
60	Initializes NUM-LOCK status and programs the KBD typematic rate.
75	Initialize Int-13 and prepare for IPL detection.
78	Initializes IPL devices controlled by BIOS and option ROMs.
7A	Initializes remaining option ROMs.
7C	Generate and write contents of ESCD in NVRam.
84	Log errors encountered during POST.
85	Display errors to the user and gets the user response for error.
87	Execute BIOS setup if needed / requested.
8C	Late POST initialization of chipset registers.
8E	Program the peripheral parameters. Enable/Disable NMI as selected
90	Late POST initialization of system management interrupt.
A0	Check boot password if installed.
A1	Clean-up work needed before booting to OS.
A2	Takes care of runtime image preparation for different BIOS modules. Fill the free area in F000h segment with 0FFh. Initializes the Microsoft IRQ Routing Table. Prepares the runtime language module. Disables the system configuration display if needed.
A4	Initialize runtime language module.
A7	Displays the system configuration screen if enabled. Initialize the CPU's before boot, which includes the programming of the MTRR's.
A8	Prepare CPU for OS boot including final MTRR values.
A9	Wait for user input at config display if needed.
AA	Uninstall POST INT1Ch vector and INT09h vector. Deinitializes the ADM module.
AB	Prepare BBS for Int 19 boot.
AC	End of POST initialization of chipset registers.
B1	Save system context for ACPI.
00	Passes control to OS Loader (typically INT19h).

Follow the steps below to make a driver diskette from the TYAN<sup>®</sup> driver CD provided.

1. Start the system and insert the TYAN<sup>®</sup> CD into the CD-ROM drive to boot from CD. You will see the following menu. Then press [1] and [Enter] to boot the system to Tyan diskette maker. (If you would like to boot from hard disk, press 0 and Enter or just wait for 10 seconds to boot automatically from hard disk.).

```
Boot from CD:
```

ISOLINUX 2.00 2002-10-25 Copyright (C) 1994-2002 H. Peter Anvin 0) Boot from first hard drive 1) Boot to TYAN<sup>®</sup> diskette maker boot: 1\_

2. Choose the chipset vender which you need from the main menu.



3. The following picture pops up after selecting the chipset model.

	TYAN <sup>®</sup> Driver Diskette Maker
01	** nVidia ** ====Choose Chipset Model==== nVidia NVRAID
	EXIT

4. After selecting the chipset model, select the OS to start the diskette making.

	TYAN <sup>®</sup> Driver Diskette Maker
	====Example Chipset Driver====
Diskette =01=	Microsoft Windows 2000 32-bit
Diskette =02=	Microsoft Windows XP 32-bit
Diskette =03=	Microsoft Windows XP 64bit
Diskette =04=	Microsoft Windows 2003 64-bit
	Back

5. Follow the instruction on menu to insert a diskette and press [ENTER].

VPlease insert a formatted diske Writing image to drive A: Track: 36 Hoad: 8 Sector: 1	tette into A:/ and press [ENTER]	

6. Using "ESC" key to quit the Tyan diskette maker. The system will automatically restart.

ACPI (Advanced Configuration and Power Interface): a power management specification that allows the operating system to control the amount of power distributed to the computer's devices. Devices not in use can be turned off, reducing unnecessary power expenditure.

**AGP (Accelerated Graphics Port):** a PCI-based interface which was designed specifically for demands of 3D graphics applications. The 32-bit AGP channel directly links the graphics controller to the main memory. While the channel runs only at 66 MHz, it supports data transmission during both the rising and falling ends of the clock cycle, yielding an effective speed of 133 MHz.

**ATAPI (AT Attachment Packet Interface):** also known as IDE or ATA; a drive implementation that includes the disk controller on the device itself. It allows CD-ROMs and tape drives to be configured as master or slave devices, just like HDDs.

**ATX:** the form factor designed to replace the AT form factor. It improves on the AT design by rotating the board 90 degrees, so that the IDE connectors are closer to the drive bays, and the CPU is closer to the power supply and cooling fan. The keyboard, mouse, USB, serial, and parallel ports are built-in.

**Bandwidth:** refers to carrying capacity. The greater the bandwidth, the more data the bus, phone line, or other electrical path can carry. Greater bandwidth results in greater speed.

**BBS (BIOS Boot Specification):** a feature within the BIOS that creates, prioritizes, and maintains a list of all Initial Program Load (IPL) devices, and then stores that list in NVRAM. IPL devices have the ability to load and execute an OS, as well as provide the ability to return to the BIOS if the OS load process fails. At that point, the next IPL device is called upon to attempt loading of the OS.

**BIOS (Basic Input/Output System):** the program that resides in the ROM chip, which provides the basic instructions for controlling your computer's hardware. Both the operating system and application software use BIOS routines to ensure compatibility.

**Buffer:** a portion of RAM which is used to temporarily store data; usually from an application though it is also used when printing and in most keyboard drivers. The CPU can manipulate data in a buffer before copying it to a disk drive. While this improves system performance (reading to or writing from a disk drive a single time is much faster than doing so repeatedly) there is the possibility of

losing your data should the system crash. Information in a buffer is temporarily stored, not permanently saved.

**Bus:** a data pathway. The term is used especially to refer to the connection between the processor and system memory, and between the processor and PCI or ISA local buses.

**Bus mastering:** allows peripheral devices and IDEs to access the system memory without going through the CPU (similar to DMA channels).

**Cache:** a temporary storage area for data that will be needed often by an application. Using a cache lowers data access times since the information is stored in SRAM instead of slower DRAM. Note that the cache is also much smaller than your regular memory: a typical cache size is 512KB, while you may have as much as 4GB of regular memory.

**Closed and open jumpers:** jumpers and jumper pins are active when they are "on" or "closed", and inactive when they are "off" or "open".

**CMOS (Complementary Metal-Oxide Semiconductors):** chips that hold the basic startup information for the BIOS.

**COM port:** another name for the serial port, which is called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another). Parallel ports transmit the bits of a byte on eight different wires at the same time (that is, in parallel form, eight bits at the same time).

**DDR (Double Data Rate):** a technology designed to double the clock speed of the memory. It activates output on both the rising and falling edge of the system clock rather than on just the rising edge, potentially doubling output.

**DIMM (Dual In-line Memory Module):** faster and more capacious form of RAM than SIMMs, and do not need to be installed in pairs.

**DIMM bank:** sometimes called DIMM socket because the physical slot and the logical unit are the same. That is, one DIMM module fits into one DIMM socket, which is capable of acting as a memory bank.

**DMA (Direct Memory Access):** channels that are similar to IRQs. DMA channels allow hardware devices (like soundcards or keyboards) to access the main memory without involving the CPU. This frees up CPU resources for other tasks. As with IRQs, it is vital that you do not double up devices on a single line. Plug-n-Play devices will take care of this for you.

**DRAM (Dynamic RAM):** widely available, very affordable form of RAM which looses data if it is not recharged regularly (every few milliseconds). This refresh

requirement makes DRAM three to ten times slower than non-recharged RAM such as SRAM.

**ECC (Error Correction Code or Error Checking and Correcting):** allows data to be checked for errors during run-time. Errors can subsequently be corrected at the same time that they're found.

**EEPROM (Electrically Erasable Programmable ROM):** also called Flash BIOS, it is a ROM chip which can, unlike normal ROM, be updated. This allows you to keep up with changes in the BIOS programs without having to buy a new chip. TYAN<sup>®</sup>'s BIOS updates can be found at <u>http://www.tyan.com</u>

**ESCD (Extended System Configuration Data):** a format for storing information about Plug-n-Play devices in the system BIOS. This information helps properly configure the system each time it boots.

Firmware: low-level software that controls the system hardware.

**Form factor:** an industry term for the size, shape, power supply type, and external connector type of the Printed Circuit Board (PCB) or motherboard. The standard form factors are the AT and ATX.

Global timer: onboard hardware timer, such as the Real-Time Clock (RTC).

HDD: stands for Hard Disk Drive, a type of fixed drive.

H-SYNC: controls the horizontal synchronization/properties of the monitor.

**HyperTransport**<sup>™</sup>: a high speed, low latency, scalable point-to-point link for interconnecting ICs on boards. It can be significantly faster than a PCI bus for an equivalent number of pins. It provides the bandwidth and flexibility critical for today's networking and computing platforms while retaining the fundamental programming model of PCI.

IC (Integrated Circuit): the formal name for the computer chip.

**IDE (Integrated Device/Drive Electronics):** a simple, self-contained HDD interface. It can handle drives up to 8.4 GB in size. Almost all IDEs sold now are in fact Enhanced IDEs (EIDEs), with maximum capacity determined by the hardware controller.

IDE INT (IDE Interrupt): a hardware interrupt signal that goes to the IDE.

**I/O (Input/Output):** the connection between your computer and another piece of hardware (mouse, keyboard, etc.)

**IRQ (Interrupt Request):** an electronic request that runs from a hardware device to the CPU. The interrupt controller assigns priorities to incoming requests and delivers them to the CPU. It is important that there is only one device hooked up to each IRQ line; doubling up devices on IRQ lines can lock up your system. Plug-n-Play operating systems can take care of these details for you.

**Latency:** the amount of time that one part of a system spends waiting for another part to catch up. This occurs most commonly when the system sends data out to a peripheral device and has to wait for the peripheral to spread (peripherals tend to be slower than onboard system components).

**NVRAM:** ROM and EEPROM are both examples of Non-Volatile RAM, memory that holds its data without power. DRAM, in contrast, is volatile.

**Parallel port:** transmits the bits of a byte on eight different wires at the same time.

**PCI (Peripheral Component Interconnect):** a 32 or 64-bit local bus (data pathway) which is faster than the ISA bus. Local buses are those which operate within a single system (as opposed to a network bus, which connects multiple systems).

**PCI PIO (PCI Programmable Input/Output) modes:** the data transfer modes used by IDE drives. These modes use the CPU for data transfer (in contrast, DMA channels do not). PCI refers to the type of bus used by these modes to communicate with the CPU.

PCI-to-PCI bridge: allows you to connect multiple PCI devices onto one PCI slot.

**Pipeline burst SRAM:** a fast secondary cache. It is used as a secondary cache because SRAM is slower than SDRAM, but usually larger. Data is cached first to the faster primary cache, and then, when the primary cache is full, to the slower secondary cache.

**PnP (Plug-n-Play):** a design standard that has become ascendant in the industry. Plug-n-Play devices require little set-up to use. Devices and operating systems that are not Plug-n-Play require you to reconfigure your system each time you add or change any part of your hardware.

**PXE (Preboot Execution Environment):** one of four components that together make up the Wired for Management 2.0 baseline specification. PXE was designed to define a standard set of preboot protocol services within a client with the goal of allowing networked-based booting to boot using industry standard protocols.
**RAID (Redundant Array of Independent Disks):** a way for the same data to be stored in different places on many hard drives. By using this method, the data is stored redundantly and multiple hard drives will appear as a single drive to the operating system. RAID level 0 is known as striping, where data is striped (or overlapped) across multiple hard drives, but offers no fault-tolerance. RAID level 1 is known as mirroring, which stores the data within at least two hard drives, but does not stripe. RAID level 1 also allows for faster access time and fault-tolerance, since either hard drive can be read at the same time. RAID level 0+1 is both striping and mirroring, providing fault-tolerance, striping, and faster access all at the same time.

RAIDIOS: RAID I/O Steering (Intel)

**RAM (Random Access Memory):** technically refers to a type of memory where any byte can be accessed without touching the adjacent data and is often referred to the system's main memory. This memory is available to any program running on the computer.

**ROM (Read-Only Memory):** a storage chip which contains the BIOS; the basic instructions required to boot the computer and start up the operating system.

**SDRAM (Synchronous Dynamic RAM):** called as such because it can keep two sets of memory addresses open simultaneously. By transferring data alternately from one set of addresses and then the other, SDRAM cuts down on the delays associated with non-synchronous RAM, which must close one address bank before opening the next.

**Serial port:** called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another).

SCSI Interrupt Steering Logic (SISL): Architecture that allows a RAID controller, such as AcceleRAID 150, 200 or 250, to implement RAID on a system board-embedded SCSI bus or a set of SCSI busses. SISL: SCSI Interrupt Steering Logic (LSI) (only on LSI SCSI boards)

Sleep/Suspend mode: in this mode, all devices except the CPU shut down.

**SDRAM (Static RAM):** unlike DRAM, this type of RAM does not need to be refreshed in order to prevent data loss. Thus, it is faster and more expensive.

**SLI (Scalable Link Interface)**: Nvidia<sup>®</sup> SLI technology links two graphics cards together to provide scalability and increased performance. Nvidia<sup>®</sup> SLI takes advantage of the increased bandwidth of the PCI Express bus architecture, and features hardware and software innovations within Nvidia<sup>®</sup> GPUs (graphics processing units) and Nvidia<sup>®</sup> MCPs (media and communications processors).

Depending on the application, Nvidia<sup>®</sup> SLI can deliver as much as two times the performance of a single GPU configuration.

**Standby mode:** in this mode, the video and hard drives shut down; all other devices continue to operate normally.

**UltraDMA-33/66/100:** a fast version of the old DMA channel. UltraDMA is also called UltraATA. Without a proper UltraDMA controller, your system cannot take advantage of higher data transfer rates of the new UltraDMA/UltraATA hard drives.

**USB (Universal Serial Bus):** a versatile port. This one port type can function as a serial, parallel, mouse, keyboard or joystick port. It is fast enough to support video transfer, and is capable of supporting up to 127 daisy-chained peripheral devices.

VGA (Video Graphics Array): the PC video display standard

V-SYNC: controls the vertical scanning properties of the monitor.

**ZCR (Zero Channel RAID):** PCI card that allows a RAID card to use the onboard SCSI chip, thus lowering cost of RAID solution

**ZIF Socket (Zero Insertion Force socket):** these sockets make it possible to insert CPUs without damaging the sensitive CPU pins. The CPU is lightly placed in an open ZIF socket, and a lever is pulled down. This shifts the processor over and down, guiding it into the board and locking it into place.

## **Technical Support**

If a problem arises with your system, you should first turn to your dealer for direct support. Your system has most likely been configured or designed by them and they should have the best idea of what hardware and software your system contains. Hence, they should be of the most assitance for you. Furthermore, if you purchased your system from a dealer near you, take the system to them directly to have it serviced instead of attempting to do so yourself (which can have expensive consequences).

If these options are not available for you then MiTAC International Corporation can help. Besides designing innovative and quality products for over a decade, Tyan has continuously offered customers service beyond their expectations. Tyan's website (http://www.tyan.com) provides easy-to-access resources such as in-depth Linux Online Support sections with downloadable Linux drivers and comprehensive compatibility reports for chassis, memory and much more. With all these convenient resources just a few keystrokes away, users can easily find the latest software and operating system components to keep their systems running as powerful and productive as possible. Tyan also ranks high for its commitment to fast and friendly customer support through email. By offering plenty of options for users, Tyan serves multiple market segments with the industry's most competitive services to support them.

# "Tyan's tech support is some of the most impressive we've seen, with great response time and exceptional organization in general" - Anandtech.com

Help Resources:

1. See the beep codes section of this manual.

2. See the TYAN<sup>®</sup> website for FAQ's, bulletins, driver updates, and other information: http://www.tyan.com

3. Contact your dealer for help BEFORE calling TYAN<sup>®</sup>.

4. Check the TYAN<sup>®</sup> user group:

alt.comp.periphs.mainboard.TYAN<sup>®</sup>

### **Returning Merchandise for Service**

During the warranty period, contact your distributor or system vendor FIRST for any product problems. This warranty only covers normal customer use and does not cover damages incurred during shipping or failure due to the alteration, misuse, abuse, or improper maintenance of products.

**NOTE:** A receipt or copy of your invoice marked with the date of purchase is required before any warranty service can be rendered. You may obtain service by calling the manufacturer for a Return Merchandise Authorization (RMA) number. The RMA number should be prominently displayed on the outside of the shipping carton and the package should be mailed prepaid. TYAN<sup>®</sup> will pay to have the board shipped back to you

141 http://www.tyan.com

### Notice for the USA



Compliance Information Statement (Declaration of Conformity Procedure) DoC FCC Part 15: This device complies with part 15 of the FCC Rules

Operation is subject to the following conditions:

This device may not cause harmful interference, and This device must accept any interference received including interference that may cause undesired operation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and the receiver. Plug the equipment into an outlet on a circuit different from that of the receiver. Consult the dealer on an experienced radio/television technician for help.

#### Notice for Canada

This apparatus complies with the Class B limits for radio interference as specified in the Canadian Department of Communications Radio Interference Regulations. (Cet appareil est conforme aux norms de Classe B d'interference radio tel que specifie par le Ministere Canadien des Communications dans les reglements d'ineteference radio.)

 $(\epsilon$ 

Notice for Europe (CE Mark) This product is in conformity with the Council Directive 2004/108/EC, 92/31/EEC (EMC).

CAUTION: Lithium battery included with this board. Do not puncture, mutilate, or dispose of battery in fire. Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by manufacturer. Dispose of used battery according to manufacturer instructions and in accordance with your local regulations.

Document #: D1950 - 100